Section F
Hazard Prevention

SECTION F

PROCEDURES TO PREVENT HAZARDS

Hukill Chemical Corporation will address the following subject areas: general security provisions; inspection schedule; request for waiver of preparedness and prevention requirements; spill prevention and containment; and prevention of accidental ignition or reaction of ignitable, reactive or incompatible wastes.

F-1 Security

F-1a Waiver

The Hukill Chemical Corporation does not request a waiver of the requirements stated in OAC 3745-54-14(A)(1) and (2) (40 CFR Part 264.14 (a) (1) and (2)) regarding injury to intruder and violation by intruder.

F-1b Security Procedures and Equipment

The general security provision of fencing and gates are supplemented by other features contributing to the safety and security of the facility. Lighting is provided around the facility and an internal telephone system is provided. All gates are closed at all times. Hukill Chemical Corporation has a hand-held radio "walkie-talkie" system which allows all plant employees to have communication with each other and the outside phone system. The portable radios are intrinsically safe and approved for operation in Class I, Group D, Division I rated operating areas.

F-1a (1) Injury to Intruder

Security measures in place should prevent any intruder from injury.

F-1a (2) Violation Caused by Intruder

Security measures in place should prevent any violation caused by an intruder.

F-1b Security Procedures and Equipment

F-1b (1) 24-Hr Surveillance System

The facility also maintains a 24-hr continuous surveillance Honeywell security system which monitors several office doors when the facility is closed.

F-1b (2) Barrier

The working area of the facility is completely enclosed within a six foot high, chain-link fence topped by three strands of barbed wire. The fence has three vehicle gates; one located for the eastern front corner of the facility; one for the western front corner; and one for the central driveway in the middle of the facility. The east and west gates are closed 24 hours per day and are locked from 6pm until 6am during the week and weekends. The central gate is open 6am to 6pm and is closed until 10:30 am and locked until 6am during the week. It is locked during the weekends.

F-1b(3) Means to Control Entry

Visitors, contractors and drivers entering the plant are required to sign a Log Sheet in the front lobby and obtain a visitor's or contractors badge (See Exhibit F-1).

HCC has had no problems with unauthorized traffic to date but maintains the east and west gates closed at all times. All gates are locked during non-operational time (holidays and weekends).

F-1c Warning Signs

Signs which are legible from a distance of 25 feet are posted at the three fence gates and several fence locations around the facility. These signs are visible from all angles of approach and bear the legend "Danger - Unauthorized Personnel Keep Out". Also "No Smoking" signs, which are legible from a distance of 25 feet, have been placed in the container storage area. "Gates Must Remain Closed" signs are posted where necessary.

F-2 Inspection Schedule

F-2a General Inspection Requirements

Hukill Chemical Corporation conducts regular inspection of the facility for equipment malfunctions, structural deterioration, operation errors, and discharges that could cause or lead to the release of hazardous waste constituents and adversely affect the environment or threaten human health. Specifically, the Weekly RCRA Inspection Log Sheet requires a general facility inspection. In addition, weekly RCRA inspections are documented for the two Emergency Response supply cabinets located in the West Warehouse and Drum Processing rooms.

F-2a(1) Types of Problems:

The inspection schedule has been designed to identify any potential or real problems with any of the operating equipment, storage areas, containment structures. This inspection schedule will allow timely identification of these problems and help in avoiding any unnecessary emergency situation at the facility. Each individual conducting these inspections has been trained in what to look for while conducting these inspections. Inspection logs are kept in the operating record. Copies of the Weekly Emergency Equipment and Weekly RCRA Inspection logs are included as Exhibit F-2A and F-2B.

F-2a(2) Frequency of Inspections:

All items on the inspection schedule will be inspected at least weekly. If certain items on the inspection schedule require more frequent inspection due to recurring malfunctions, the inspection schedule will be modified to reflect this need.

Due to continuous operations at the facility, all hazardous waste handling areas are subject to daily inspection. In addition, HCC has set up a shift-specific inspection requirement for these areas. These "Housekeeping Inspection" logs are shown as Exhibit F-11 and are a program Hukill has developed to help its workers understand the importance of RCRA housekeeping. These are included for information only and are not intended to be an "official" part of this permit application (not subject to permit modification process).

F-2a(3) Remedial Action:

Due to the nature of the process and the characteristics of the material being stored, deterioration of storage containers and tanks is not rapid and for this reason deterioration rate was not the determining factor in frequency of reinspection.

F-2a(4) Inspection Logs

Inspection logs, detailed above, and shown in the referenced exhibits, will be kept in the facility's operating record for at least 3 years from date of inspection.

F-2b Specific Process Unit Inspections

F-2b(1) Container Inspection

As detailed above, weekly inspections are performed on all container storage and handling areas.

Inbound Inspection of Containerized Hazardous Waste

All inbound drums will be inspected prior to acceptance for storage and processing. Containers will be inspected for the following:

1. Loose bungs or lids.
2. Evidence of leaking material.
3. Any structural damage such as denting.
4. Evidence of corrosion at seams or threaded openings.
5. Evidence of over pressuring such as bulging lids or bottoms.
6. Proper labeling - stenciling.

Inspections of Container Storage Areas - Free Liquids

Daily inspections are carried out in the storage areas for containerized hazardous waste containing free liquids. Containers will be inspected for the following:

1. Evidence of improper stacking, aisle spacing, palletizing.
2. Evidence of leaking material.
3. Any structural damage such as denting.
4. Evidence of corrosion at seams or threaded openings.
5. Evidence of over pressuring such as bulging lids or bottoms.
6. Proper labeling of hazardous waste.

Weekly inspection in the same areas will be performed to check the status of the containment system:

1. Check for evidence of structural damage to metal walls.
2. Check bases, ramps, and curbs for evidence of cracking or damage that might lead to a loss of containment capability.

3. Check floor for any cracks, evidence of spills and evidence of chemical attack, such as pitting of the surface.

F-2b(1)(c) Inspection of Container Storage Areas-No Free Liquids

For containers themselves, the same inspection list as for containers with free liquids would apply. The inspection will be done weekly. For the no free liquids area, the following conditions will be inspected on a weekly basis:

1. Proper palletizing, pallet arrangement, aisle spacing.

2. Evidence of structural damage to the concrete or fenceline curb.

F-2b(2) Tank System Inspections

F-2b(2)(a) Tank System Overfilling Control Equipment

As required by OAC 3745-55-95 (40 CFR 264.195) the following items will be inspected on a daily basis:

1. All level floats will be checked to make sure that cables are intact and the cable - pulley system moves freely.

2. All line valves on the tank filling - emptying line will be inspected for tight shut off and to make sure valve packing is not leaking.

3. All pumps will be inspected to insure that on/off switch gear is in proper working order.

4. Dikes are intact. Inspect concrete walls and slab for cracking, spalling, joint seal damage and discoloration due to leakage of hazardous material.

5. Test the high level alarm system by pressing the reset button to be sure that all tank annunciators light up and that the alarm sounds.

F-2b(2)(b) Tank System External Corrosion and Releases

As required by OAC 3745-55-95 (40 CFR 264.195) the following tank structural and fittings items will be inspected on a daily basis.

1. A visual inspection of all above ground portions of each tank will be completed with particular attention paid to evidence of rusting, pitting, or contents leakage at the following:

   a. All welds at plate joints.

   b. All welds at dome to shell and bottom to shell seams.

   c. All fittings, nipples and pipe inlets to the shell, dome or bottom of the tank.

   d. All structural supports.

2. The area immediately surrounding the tank will be visually inspected for evidence of hazardous material leaks.

F-2b(2)(c) Tank System Monitoring and Leak Detection Equipment

All tanks are aboveground and are located in concrete dikes sized to contain the volume of the largest tank plus stormwater from a 25 yr/24-hr storm event. Daily visual inspections would reveal any releases.

F-2b(2)(d) Tank System Construction Materials and Surrounding Area

In Section D, Hukill Chemical Corporation presented tank integrity assessments.

Piping Inspection

Process Piping associated with transferring hazardous waste will be inspected on a daily basis, while operating.

1. Visual inspection of piping exterior for signs of corrosion, rusting, and pitting.

2. Visual inspection of all threaded connections to check for deteriorating joints or leakage of process fluids. Also, inspect for any corrosion or erosion at threaded connections.

3. If piping is hung over head, make sure all hangers are adequately supporting pipe. No bending or deformities will be allowed in the piping run.

4. Conservation vents performing properly on filling and emptying.

5. Additional inspections of the piping systems occur when a line is connected for operation. The operators are instructed to inspect the quick connector gaskets and locking devices and to repair or replace as required. The valves are also inspected during the VOC testing in compliance with the federal regulations for fugitive emissions.

Remedial Action

If inspections reveal that non-emergency maintenance is needed, this will be completed as soon as possible to preclude further damage and review the need for emergency repairs. If a hazard is imminent or has already occurred during the course of an inspection or any time between inspections, remedial action will be taken immediately. Hukill Chemical Corporation's personnel will notify the appropriate authorities per the Contingency Plan (See section G) and initiate emergency actions. In the event of an emergency involving the release of hazardous constituents to the environment, efforts will be directed toward containing the hazard, removing it and subsequently decontaminating the affected area. Refer to Contingency Plan for further details.

F-2b(2)(e) Tank System Cathodic Protection

N/A

F-2b(2)(f) Operating Record:

An inspection log and inspection schedule has been developed to document inspections conducted at the facility.

The inspection log contains:

1. The inspectors name.

2. Observations made during the inspection.

3. Remedial actions taken in response to identified malfunction.

4. Date and time of the inspection.

NOTE: The inspection log forms can be found in Exhibit F-2.

F-2b(3-8)

N/A

F-3 Exemption From or Documentation of Preparedness and Prevention Requirements

F-3a Justification for Exemption Request

The applicant does not wish to request a waiver of the preparedness and prevention requirements under OAC 3745-54-30 (40 CFR 264 Sub Part C). Requirements of this Sub Part are primarily addressed in Section D, Section F, and Section G of this application.

F-3b Design and Operation of the Facility

See Section D, Process Description, of this application.

F-3c Equipment Requirements

F-3c(1) Internal Communications

Internal and external communications, emergency equipment, and fire control equipment are discussed in Section G, Contingency Plan.

F-3c(2) External Communications

Internal and external communications, emergency equipment, and fire control equipment are discussed in Section G, Contingency Plan.

F-3c(3) Emergency Equipment

Internal and external communications, emergency equipment, and fire control equipment are discussed in Section G, Contingency Plan.

F-3c(4) Water For Fire Control

See Section G, of this application for detail regarding the facility's fire suppression system.

F-3d Access to Communications or Alarm System

See Section B or Section G of this application.

F-3e Aisle Space Requirement

Aisle space requirements are addressed in Section D for each containerized hazardous waste. Portable (Tote-type) containers take up the same floor space as the pallets. There will be two feet of space between double rows of these portable containers.

F-3f Arrangements/Agreements with Local Authorities

F-3f(1)-F-3f(4) Agreements with Local Emergency Planning authorities has been covered in Section G-Contingency Plan of this application. Further detail is also provided in Hukill" Emergency Response Plan which is an attachment ot the Contingency Plan.

Hukill provides yearly EPCRA, SARA Title III, Section 312 Emergency and Hazardous Chemical Inventory Reports to: Cuyahoga County LEPC and the Bedford Fire Department. These reports provide maximum quantities of all chemicals stored at the facility in any given instance. These reports account for hazardous chemical storage in containers and tanks.

In addition, the Bedford Fire Department will tour the facility yearly in order to stay familiar with plant operations and become familiar with any process changes or additions which may have been added since the last inspection. The last visit by Bedford Fire occurred on March 28, 2003.

The Southeast Chagrin HazMat Response Team will often train for emergency rescue and confined space rescue at Hukill's facility (last training Summer, 2001).

The Bedford Hospital is familiar with Hukill's operations as a result of Risk Management Planning reporting requirements (40 CFR Part 68). Hukill must notify and send periodic updates regarding the storage of hydrofluoric acid 70% on site. Consequently, Bedford Hospital is also aware of the hazardous waste operations that occur at the facility.

F-3f(5) Documenting Refusals

Should this situation arise, Hukill would document this refusal in the operating record.

F-4 Preventative Procedures, Structures and Equipment

Detailed procedures may be found HCC Total Quality Management ISO 9000.2001 Procedures. Site personnel are trained to the procedures a copy of the Table of Contents is Attachment F-12. Copies of the procedures are available for OEPA review during inspections.

F-4a Loading / Unloading Operations

There are three basic loading / unloading activities at the facility. These are:

1. The removal of waste from transport vehicles into tank or container storage at the facility;

2. The transfers of material from storage into the HW Fuels Blend process; and

3. The loading of waste for transport to a permitted TSD facility.

Please refer to Figures F-3A for the unloading area for the current facility.

F-4a Unloading Operations

Unloading into Storage

Unloading into storage occurs at the bulk unloading area on the north east side of the facility. Unloading into the hazardous waste storage tanks is accomplished either by using portable transfer pumps or pumping through the manifold strainer. (See Figure F-3A) This area is under cover and protected from run-on. During unloading operations, spills are unlikely. Drivers are required to stand by their equipment and respond if a spill situation occurs. In the event of an accident, the material will be contained with sandbags, standard industrial absorbent, absorbent boom or pads, or dirt. Spill response supplies are located adjacent to this area for immediate response in the gray "Emergency Response" Rubbermaid (or equivalent)

storage shed. Clean up material will be handled as outlined in the facility Contingency Plan. (See Section C and G)

Waste in containers is unloaded at the box truck unloading dock accessed via the central gate to the facility. The containers are placed in an area where they are inspected, stenciled, and sampled prior to being moved into the container storage area for free liquids. Several precautions have been taken to reduce potential for hazards in the free liquid container storage area. First, the doorways to the storage area have been raised and ramped creating a large containment area. Second, adequate aisle space has been provided for access to drums. (See Plan Sheet 7) All full or partially full drums are stored on wooden pallets.

Unloading To Recovery

In order to conduct the solvent recovery process, waste must be transferred from tanks or containers into the recovery process. Tank unloading at the East Pad Unloading area is accomplished by way of gravity feed piping systems with valves located at the northeast corner of the facility. (See Figure F-6) These valves are located within the Tank Storage Area containment system so any spillage from valve malfunction will be contained in the storage area. Container unloading to recovery also occurs adjacent to this area and is accomplished by opening and pumping the contents of each container with a positive displacement pump. Drums which contain viscous, unpumpable solids are deheaded and processed by the Auger Processing System as part of the H W Fuels Blend program as are still bottoms from the recovery process.

Note that the lines from the tanks contain two valves. The valve at the tank is always kept closed and must be manually opened prior to draining the tank. The valve is mounted on the tank to allow for isolation of the tank in case of a discharge system failure. The valves at the edge of the dikes are used for flow control.

H W Fuels Blend and Solid Waste Loading

H W Fuels Blend is loaded into tank trailers at the East Pad unloading area. Precautions outlined above are followed during this procedure. Also, containers of solid waste are periodically loaded into trailers for disposal at an appropriate facility. The same precautions followed during the unloading of containers are followed during this loading operation.F-4b Runoff

The only potential area where runoff may be generated is in the Tank Storage Area. Runoff from the Tank Storage Area is held within the storage area dikes until it is possible to remove it. (See Plan Sheet 2). Prior to discharge, the water is sampled and analyzed by Hukill's laboratory to determine total organic chemical concentrations. Depending upon the analytical results, a determination is made for the appropriate handling technique, i.e. hazardous waste T.S.D. Facility, or sanitary sewer (via stormwater handling system).

Please refer to Section B "Runoff Control Systems" for a description of the Surface Run-Off Containment System.

F-4c Water Supplies

Ground water contamination is prevented by eliminating the discharge of hazardous materials onto the unprotected ground. All hazardous waste areas are concrete or some have some form of secondary containment (steel floor, coating) to contain leaks, spills, and precipitation.

F-4d Equipment and Power Failure

In the event of a brief power interruption, the emergency lighting system will activate automatically to supply lighting to all facility buildings and the property. If there is a prolonged power outage, the waste feed lines from the tank storage area will be manually shut off and all plant operations will be shut down. After shutdown, maintenance personnel will check for malfunctions and equipment failures. The local power and light company will be contacted for assistance as required.

F-4e Personal Protection Equipment

Specific information on the major medical components of the waste in the container and tank storage areas is provided in the MSDS sheets which are located in the Operating area as required by the OSHA Hazard Communication Standard 29 CFR 1910.1200. The sheets present information on various chemicals regarding toxicity, fire, and explosion hazards, protective equipment recommendations and first aid. Available protective equipment for the existing facilities is described under emergency equipment and provisions of the Contingency Plan. (See Section G) Use of protective equipment is covered in the initial and annual personnel training programs (See Section H), which satisfies the OSHA safety standards of 29 CFR, part 1910, Subpart I - Personal Protective Equipment. Facility personnel have also been instructed on the proper use of organic vapor, acid gas and ammonia vapor respirators

which are to be used when significant concentrations of hazardous vapors are suspected. Hukill maintains a PPE policy which covers all process areas of the facility (not limited to hazardous waste operations).

F-5 Prevention of Reaction of Ignitable, Reactive, and Incompatible Wastes

F-5a Precautions To Prevent Ignition or Reaction of Ignitable or Reactive Wastes Wastes

The permitted container storage areas H W Fuels Blend Tank Farms, and Generator Accumulation area are the only areas on the facility property where ignitable wastes are stored. However, since Hukill is a solvent recovery facility and chemical distributor, Hukill Chemical Corporation stores virgin and reclaimed ignitable materials in other warehouse and dike locations on the property. No reactive wastes are stored at the facility. The waste containers are compatible with the contained wastes, therefore, the only source of ignition is external to the containers. To prevent a possible source of external ignition, drums containing ignitable wastes are labeled and signs are placed in the container storage area clearly marked with the legends "No Smoking" and "Danger - Unauthorized Personnel Keep Out." Hukill maintains a zero-tolerance policy regarding smoking in these areas. Spark proof tools (brass hammers, wrenches, etc.) are used on all containers and tanks storing ignitable materials.

Lift truck operators are instructed on the safe and proper handling of drums of ignitable materials. Their instructions include: "Use Reduced Speed; Carry Forks Low' Sound Horns When Going Through Doors or Around Corners With Reduced Visibility." In addition, all forklift drivers receive forklift safety training every three years or as new employes per the OSHA 1910.178 standard. This includes instruction about the proper way to carry loads. A small driving test is also administered. (See onsite Personnel Training file for records.)

The fork lift trucks assigned to the Hazardous Waste Storage Area and Process Area are propane gas powered.

The Hazardous Waste Container Storage area and Drum Process area are wired for Class I, Group D, Division I rating. There is an automatic CO2 supression systems for this warehouse whichis inspected yearly. Other areas of the plant have a water sprinkler-head system capable of delivering a minimum of 250,000 gallons. The sprinkler system is monitored by a Security Service 24 hours a day, every day.

F-5b General Precautions For Handling Ignitable or Reactive Wastes or Accidentally Mixing Incompatible Wastes

General precautions for handling ignitable wastes are discussed above. Incompatible wastes are not mixed at Hukill Chemical Corporation.

F-5c Documenting Compliance with General Requirements for Ignitable, Reactive or Incompatable Waste

Precautions taken in the container storage areas to prevent accidental fire and explosion include the proper storage of containers, i.e., stacking, aisle space, labeling, and sealing of containers, dikes, sump areas, sump pumps and appropriate warning signs. The Processing Equipment is grounded. The concrete floor is constructed with grounded reinforcing rod and coated with a non-sparking material.

Proper Bonding and Grounding techniques are followed for any flammable liquid to/from container transfer and employees have been trained in the practice (see onsite Personnel Training file).

Waste container contents are verified in accordance with the Waste Analysis Plan, Section C of this application.

F-5d & F-5e Management of Ignitable, Reactive and Incompatable Waste in Containers

Once the container is taken off the truck, it is inspected to damage and to make sure the drum has been properly sealed and labeled by the Generator. Prior to storage, each container is sealed and labeled. This prevents vapors from escaping the drum and prevents precipitation from entering the drum. In addition, the labeling identifies the contents of the container and the date the wastes were placed in storage. Containers are stored on pallets to minimize contact with precipitation, leaks, or spills and they are never stacked more than two or three containers high depending on the storage area. The container storage areas are located more than 50 feet from the closest property line, which is in compliance with the OAC 3745-55-76 (40 CFR Part 264.176) for storage of containers holding ignitable wastes.

The drum label identifies the source of the material, the number of drums in the shipment, manifest number, the job order number it is to be processed on, and waste processing codes which detail how the material in the drum should be processed. This information remains on the drums

until they are empty. At that time, all labels and identifying codes are painted over. The label information allows Hukill Chemical to track wastes through their reclaiming processes and prevents mixing incompatible wastes.

F-5f through F-5g Management of Ignitable, Reactive and Incompatable Wastes In Tanks

See the Table which follows for tank information. Hukill does not manage any reactive wastes in any tank system. Table F-5f, last page, has been included for clarification since several documents within OEPA's files may have the historical tank numbering nomenclature.

Of the 7 tanks located in the hazardous waste storage tank dike (7-Tank Dike), only six are reserved for our recyclable raw material which is designated a "waste". The tanks designated for this "waste" are shown in relation to the entire facility in Figure F-3, the complete Tank Farm B in Figure F-4, the immediate area in Tank Farm B in Figure F-5, and by themselves in Figure F-6.

The six tanks T-57, T-58, T-59, T-60, T61, T-62 are of A-285B steel construction, 3/8" thick, 10.5' in diameter and 24' feet high. The T-56 tank is 12' diameter and 15'-7" high with stainless steel construction. The Bottoms Storage Tank is 10.5' in diameter, 32' high, and 1/4" thickness with a cone bottom and carbon steel construction. The two 6,000 gallon feed tanks, East and West, are 8' diameter, 18' high, and 1/4" thickness with cone bottoms and carbon steel construction.

These tanks are constructed to meet "UL" standards for flammable liquid storage. The storage must be atmospheric storage. These tanks comply with NFPA buffer zone requirements. All tanks are at least 5' from the nearest side of any public way and the nearest property line on which a structure can be built. They are 5 feet away from any buildings.

Tanks T- 15, T-14 and T-16 previously considered 90-day Generator or Process tanks, have been added to the existing permitted tank list due to the revised Ohio EPA policy. These are carbon steel tanks with cone bottoms. The location of these tanks is shown in Figure F-3, in the appendix to this section, and in Figure D-7, in the appendix to Section D. Their dimensions have been added to the list.

Four 3,000 gallon agitated Feed tanks (Tanks 8-11) are permitted tanks. These four tanks are located indoors, in the Distillation process Area .

The Hockmeyer tank is a 1,000 gallon capacity tank used for processing containerized waste in the East Warehouse. It is primarily used for blending and first-stage filtration. The Auger system mix tank (hydropulper) is 750-gallon capacity and is also located in the East Warehouse and is used for "pulping" hazardous waste. See Section D, of this application for more information about these two process units.
All electricals in the areas of the existing and planned storage tanks are Class 1, Group D, Division 1. All of these tanks are properly grounded for static electricity.

Tank Capacity/Size Table

Tank Designation	Capacity	Size	Shell Thickness
T57	14M gal.	10.5'X 24' high	3/8"
T58	14M gal.	10.5'X 24' high	3/8"
T59	14M gal.	10.5'X 24' high	3/8"
T60	14M gal.	10.5'X 24' high	3/8"
T61	14M gal.	10.5'X 24' high	3/8"
T62	14M gal.	10.5'X 24' high	3/8"
T56	14M gal.	12' X 15'7"high	3/16"
T55	16M gal.	10.5'X 32' high	1/4"
T53	6M gal.	8' X 18' high	1/4"
T52	6M gal.	8' X 18' high	1/4"
T15	9M gal.	9.5'X 24' high	1/4"
T14	10M gal.	10.0'X 26' high	1/4"
T16	6M gal.	10.5' X 17' high	1/4"
8-3-F	3M gal.	7' X 13' high	7 GA.
9-3-F	3M gal.	7' X 13' high	7 GA.
10-3-F	3M gal.	7' X 13' high	7 GA.
11-3-F	3M gal.	7' X 13' high	7 GA.
Hockmeyer Tk.	1M gal.	6' X 7'4"high	1/4"
Auger Mix Tank	750 gal.	5' X 5.5' high	1/4"

The 14,000 gallon tanks (Tanks 56-62) were relocated in early 1989 from the gravel-on-clay base dike to the new concrete hazardous waste storage tank dike constructed on the east side of Tank Farm B. This dike is referred to as the "7-Tank Dike". Each tank is on a "Housekeeping Pedestal" which is on the concrete containment slab. The dike slab is

constructed of 4,000 PSI. Concrete with two layers of steel mesh per the design of the structural engineering consultant.

Plan Sheet 11B is the construction drawing for this containment area. Exhibit D-2, Section D, page 12, is a copy of the consulting structural engineer's inspection report. Tanks 52,53 and 55 are typically used for Luwa waste sludges and bottoms and are located in a separate dike adjacent to the "7-Tank Dike" All tanks are located in a diked concrete area.

There has been evidence of some corrosion based on visual and ultrasonic inspection and review of tank practices. There has been no seam leakage based on facility tank inspection practices.

Tank trucks are unloaded into the six tanks T-57, T-58, T-59, T-60, T-61 and T-62 reserved for in-bound H W Fuels Blend and solvent waste. They work as a group based on fill capacities, scheduling requirements, and the inbound truck scheduling. Tank T-56 is also used to store spent solvent.

Each day all hazardous wastes tanks are inventoried and tracked by Hukill's 'real-time' Access Inventory Management database. This database is available for OEPA Inspection at any time and is always reviewed by OEPA personnel during semi-annual RCRA inspections. See Exhibits F-8, F-9 and F-10 for examples.

Always the utility worker observes the tank level as he is loading and unloading waste tanks. The current levels are updated in the Access Inventory database for all tanks before and after loading or transfers. The high level probes in each of the seventeen hazardous waste storage tanks are connected to an annunciator which alarms on high level and provides visual status of high level for the tanks. The Hockmeyer and Auger tank levels are monitored continuously as part of the H.W. Fuels Blend process.

All valves are manually operated; all hose connections, as well as pump start/stop switches are in the immediate work area of the utility man on duty. All these hose and pump connections take place in the truck unloading area (East Pad) on a concrete slab located under a roof or canopy area adjoining the Process Building.

Hukill Chemical has no incompatible wastes stored in tanks.

F-5h through F-5o (Waste Management in Surface Impoundments, Waste Piles, Land Treatment Units, Landfills)

Does not apply to Hukill operations.

TABLE F-5F

HAZARDOUS WASTE TANKS
HISTORICAL –VS- CURRENT NUMBERING

Historical H.W. Tank Number	Current H.W. Tank Number
V-114	T-57
V-214	T-58
V-314	T-59
V-414	T-60
V-514	T-61
V-614	T-62
V-120	T-56
V-117	T-55
East Feed	T-53
West Feed	T-52
V-110M	T-15
V-210M	T-14
V-6000C	T-16
8-3-F	8-3-F
9-3-F	9-3-F
10-3-F	10-3-F
11-3-F	11-3-F

HUKILL CHEMICAL CORPORATION
RCRA Inspection Log - Weekly
GENERAL FACILITY

Inspector: _____ Date: _____ Time: _____

Conditions		Indicate with an "X" a condition which exists	Observations Indicate row #'s & positions		Corrective Actions: Person Making Corrections	Corrective Action Taken	Date/Time
NO FREE LIQUIDS AREA	1			1			
Evidence of Spillage or	2			2			
Leakage from Container(s)	3			3			
Deteriorated or damaged	1			1			
container(s) (rusty, dented,	2			2			
or of poor integrity	3			3			
Improper aisle spacing	1			2			
(24" between rows)	2			3			
	3			1			
Improper Labeling	1			2			
(HW, Acc Start date)	2			3			
Container(s) improperly closed	1			1			
	2			2			
Incompatible wastes	1			1			
stored together	2			2			
Poor Housekeeping (debris,	1			1			
general cleanliness)	2			2			
Waste outside of proper	1			1			
storage container	2			2			
SECURITY FENCING							
Holes, breaks, gaps in facility	1			1			
fencing, allowing entry	2			2			
EMERGENCY & SPILL							
CONTROL EQUIPMENT	1			1			
(doghouse at East Pad corner)	2			2			
Listed equipment missing	3			3			
COMMUNICATONS							
SYSTEMS	1			1			
Telephone system disabled	2			2			
Hand-held radios unavailable	3						
Portable phones unavailable							
NEW DIKE AREA							
Cracks, erosion or other	1			1			
deterioration to dike	2			2			
walls, corners or joints							

HUKILL CHEMICAL CORPORATION
RCRA Inspection Log - Weekly
TRANSFER AND RECEIVING DOCK AREAS

Inspector: _____ Date: _____ Time: _____

Conditions		Indicate with an "X" a condition which exists	Observations Note Locations		Corrective Actions: Person Making Corrections	Corrective Action Taken	Date/Time
Bulk Transfer Area							
Evidence of leakage or spillage from handling	1			1			
	2			2			
	3			3			
Material present in collector pans when not in use	1			1			
	2			2			
Collector pans not properly labeled	1			1			
	2			2			
HCC generator drums not properly closed and labeled	1			1			
	2			2			
	3			3			
Waste present on transfer pumps, equip., or containment	1			1			
	2			2			
	3			3			
Spalled, cracked or otherwise damaged concrete in handling area	1			1			
	2			2			
	3			3			
Poor Housekeeping	1			1			
	2			2			
Leaks at transfer pump seal	1			1			
	2			2			
Receiving Dock							
Evidence of spillage or leakage from containers	1			1			
	2			2			
	3			3			
Container(s) not properly closed	1			1			
	2			2			
	3			3			
Containers present beyond 24 hours	1			1			
	2			2			
	3			3			
Cracks, erosion or other deterioration to concrete	1			1			
	2			2			

HUKILL CHEMICAL CORPORATION
RCRA Inspection Log - Weekly
CONTAINER STORAGE AREA

Inspector: _____ Date: _____ Time: _____

Conditions		Indicate with an "X" a condition which exists	Observations Indicate row #'s & positions		Corrective Actions: Person Making Corrections	Corrective Action Taken	Date/Time
Evidence of Leakage From Containers	1			1			
	2			2			
	3			3			
	4			4			
	5			5			
Deteriorated or damaged containers (rusty, dented, or otherwise of poor integrity	1			1			
	2			2			
	3			3			
	4			4			
	5			5			
Improper aisle spacing (24" between rows)	1			1			
	2			2			
	3			3			
	4			4			
	5			5			
Improper labeling (HW, HCC Gen., ACC. Start date Proper stencilling)	1			1			
	2			2			
	3			3			
	4			4			
Water or Liquid Present	1			1			
	2			2			
	3			3			
Damage to Steel Containment Lining	1			1			
	2			2			
	3			3			
	4			4			
Containers improperly closed or sealed	1			1			
	2			2			
	3			3			
Incompatible wastes stored together	1			1			
	2			2			
	3			3			
Poor Housekeeping (debris, general cleanliness)	1			1			
	2			2			
	3			3			
Waste outside of proper storage container	1			1			
	2			2			
	3			3			
Warning signs not present or damaged	1			1			
	2			2			
	3			3			

HUKILL CHEMICAL CORPORATION
RCRA Inspection Log - Weekly

Fuels Blending Process Equipment

Inspector: _____ Date: _____ Time: _____

Conditions		Indicate with an "X" a condition which exists	Observations Note Locations		Corrective Actions: Person Making Corrections	Corrective Action Taken	Date/Time
Evidence of Leakage from Hochmeyer or Auger Tank	1			1			
	2			2			
	3			3			
	4			4			
	5			5			
Damage to tanks or associated piping, or otherwise concern for system integrity	1			1			
	2			2			
	3			3			
	4			4			
	5			5			
Cracks, deterioration or erosion to auger platform, elevators, pumps and piping	1			1			
	2			2			
	3			3			
	4			4			
	5			5			
Cracks, deterioration or erosion to Hochmeyer elevator	1			1			
	2			2			
	3			3			
	4			4			
Cracks, deterioration or erosion to Hochmeyer pumps and piping	1			1			
	2			2			
	3			3			
Cracks, erosion or other deterioration to Hochmeyer overflow tank	1			1			
	2			2			
	3			3			
	4			4			
Cracks, erosion or wear to containment steel floor	1			1			
	2			2			
	3			3			
Poor Housekeeping, debris general cleanliness	1			1			
	2			2			
	3			3			
Spilled or leaked waste present on floor or equipment	1			1			
	2			2			
	3			3			
	1			1			
	2			2			
	3			3			
	1			1			
	2			2			
	3			3			

HUKILL CHEMICAL CORPORATION
RCRA Inspection Log - Weekly
FEED TANK SYSTEM (Tanks 8 to11)

Inspector: _____ Date: _____ Time: _____

Conditions		Indicate with an "X" a condition which exists	Observations Note Locations		Corrective Actions: Person Making Corrections	Corrective Action Taken	Date/Time
Evidence of Leakage From Tanks or Piping	1			1			
	2			2			
	3			3			
	4			4			
	5			5			
Deterioration or damage to vessels or associated piping, or otherwise concern for system integrity	1			1			
	2			2			
	3			3			
	4			4			
	5			5			
Cracks, deterioration or erosion to tank legs or supports	1			1			
	2			2			
	3			3			
	4			4			
	5			5			
Settling of foundations for tanks, pipe supports, etc.	1			1			
	2			2			
	3			3			
	4			4			
Cracks, erosion or other deterioration to dike walls, corners or joints	1			1			
	2			2			
	3			3			
Cracks, erosion or other deterioration to sumps	1			1			
	2			2			
	3			3			
	4			4			
Cracks, erosion or wear to containment system liner or coating	1			1			
	2			2			
	3			3			
Poor Housekeeping, debris general cleanliness	1			1			
	2			2			
	3			3			
Spilled or leaked waste present within conainment	1			1			
	2			2			
	3			3			
	1			1			
	2			2			
	3			3			
	1			1			
	2			2			
	3			3			

HUKILL CHEMICAL CORPORATION
RCRA Inspection Log - Weekly

F-1 DIKE SYSTEM (Tanks 13 to 16)

Inspector: _____ Date: _____ Time: _____

Conditions		Indicate with an "X" a condition which exists	Observations Note Locations		Corrective Actions: Person Making Corrections	Corrective Action Taken	Date/Time
Evidence of Leakage From Tanks or Piping	1			1			
	2			2			
	3			3			
	4			4			
	5			5			
Deterioration or damage to vessels or associated piping, or otherwise concern for system integrity	1			1			
	2			2			
	3			3			
	4			4			
	5			5			
Cracks, deterioration or erosion to tank legs or supports	1			1			
	2			2			
	3			3			
	4			4			
	5			5			
Settling of foundations for tanks, pipe supports, etc.	1			1			
	2			2			
	3			3			
	4			4			
Cracks, erosion or other deterioration to dike walls, corners or joints	1			1			
	2			2			
	3			3			
Cracks, erosion or other deterioration to sumps	1			1			
	2			2			
	3			3			
	4			4			
Cracks, erosion or wear to containment system liner or coating	1			1			
	2			2			
	3			3			
Poor Housekeeping, debris general cleanliness	1			1			
	2			2			
	3			3			
Spilled or leaked waste present within conainment	1			1			
	2			2			
	3			3			
	1			1			
	2			2			
	3			3			
	1			1			
	2			2			
	3			3			

HUKILL CHEMICAL CORPORATION
RCRA Inspection Log - Weekly

7 TANK DIKE SYSTEM (Tanks 56 to 62)

Inspector: _____ Date: _____ Time: _____

Conditions		Indicate with an "X" a condition which exists	Observations Note Locations		Corrective Actions: Person Making Corrections	Corrective Action Taken	Date/Time
Evidence of Leakage From Tanks or Piping	1			1			
	2			2			
	3			3			
	4			4			
	5			5			
Deterioration or damage to vessels or associated piping, or otherwise concern for system integrity	1			1			
	2			2			
	3			3			
	4			4			
	5			5			
Cracks, deterioration or erosion to tank legs or supports	1			1			
	2			2			
	3			3			
	4			4			
	5			5			
Settling of foundations for tanks, pipe supports, etc.	1			1			
	2			2			
	3			3			
	4			4			
Cracks, erosion or other deterioration to dike walls, corners or joints	1			1			
	2			2			
	3			3			
Cracks, erosion or other deterioration to sumps	1			1			
	2			2			
	3			3			
	4			4			
Cracks, erosion or wear to containment system liner or coating	1			1			
	2			2			
	3			3			
Poor Housekeeping, debris general cleanliness	1			1			
	2			2			
	3			3			
Spilled or leaked waste present within conainment	1			1			
	2			2			
	3			3			
	1			1			
	2			2			
	3			3			
	1			1			
	2			2			
	3			3			

HUKILL CHEMICAL CORPORATION
RCRA Inspection Log - Weekly
FEED AND BTMS TANKS (Tanks 52 to 55)

Inspector: _____ Date: _____ Time: _____

Conditions		Indicate with an "X" a condition which exists	Observations Note Locations		Corrective Actions: Person Making Corrections	Corrective Action Taken	Date/Time
Evidence of Leakage From Tanks or Piping	1			1			
	2			2			
	3			3			
	4			4			
	5			5			
Deterioration or damage to vessels or associated piping, or otherwise concern for system integrity	1			1			
	2			2			
	3			3			
	4			4			
	5			5			
Cracks, deterioration or erosion to tank legs or supports	1			1			
	2			2			
	3			3			
	4			4			
	5			5			
Settling of foundations for tanks, pipe supports, etc.	1			1			
	2			2			
	3			3			
	4			4			
Cracks, erosion or other deterioration to dike walls, corners or joints	1			1			
	2			2			
	3			3			
Cracks, erosion or other deterioration to sumps	1			1			
	2			2			
	3			3			
	4			4			
Cracks, erosion or wear to containment system liner or coating	1			1			
	2			2			
	3			3			
Poor Housekeeping, debris general cleanliness	1			1			
	2			2			
	3			3			
Spilled or leaked waste present within conainment	1			1			
	2			2			
	3			3			
	1			1			
	2			2			
	3			3			
	1			1			
	2			2			
	3			3			

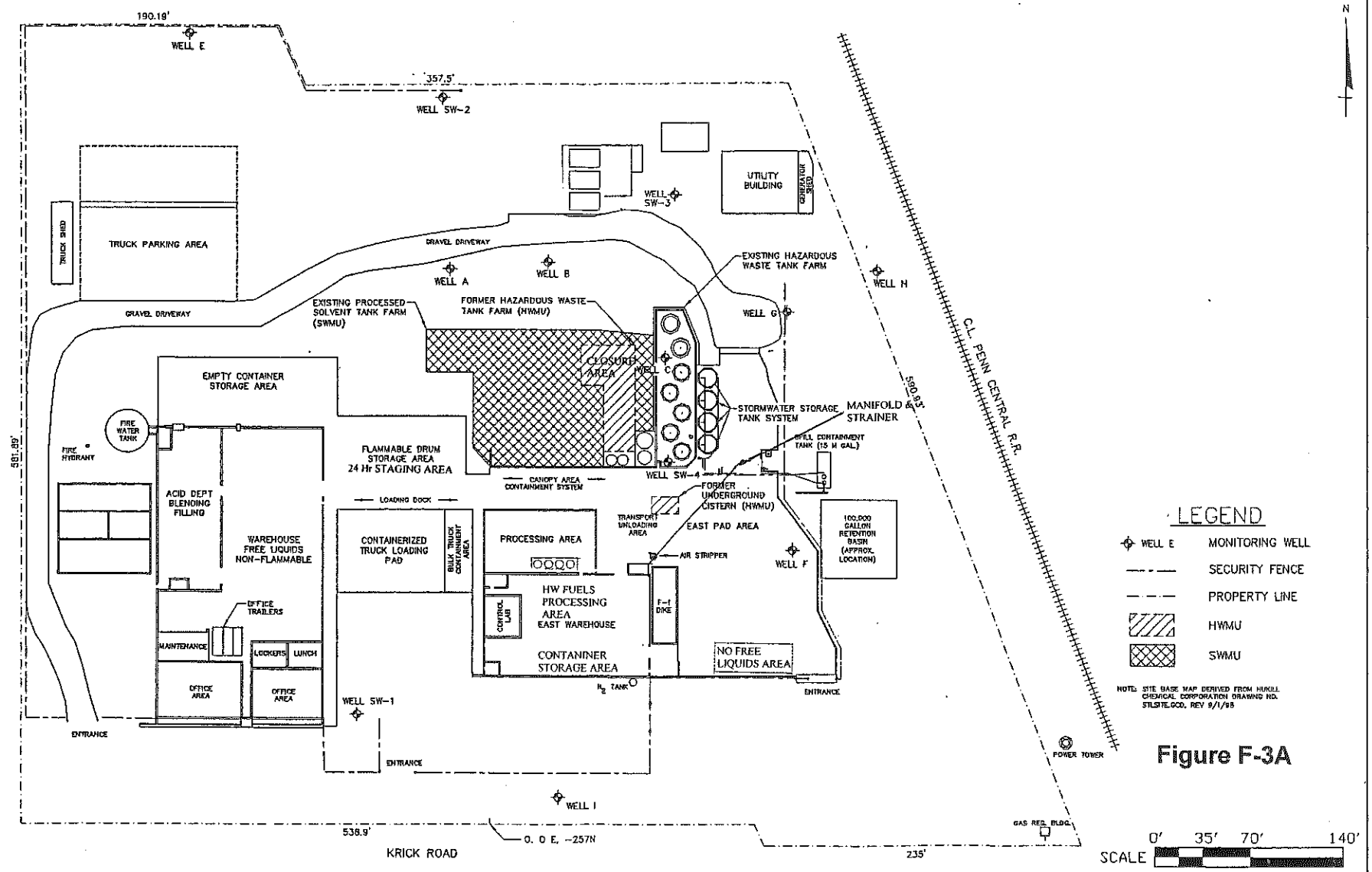

Figure F-3A

SITE MAP

HUKILL CHEMICAL CORPORATION
BEDFORD, OHIO

MAY 2004

33621.06

33621X019.DWG

HUKILL CHEMICAL CORPORATION
RCRA Inspection Log - Weekly
GENERAL FACILITY

Inspector: _____ Date: _____ Time: _____

Conditions		Indicate with an "X" a condition which exists	Observations Indicate row #'s & positions		Corrective Actions: Person Making Corrections	Corrective Action Taken	Date/Time
NO FREE LIQUIDS AREA	1			1			
Evidence of Spillage or	2			2			
Leakage from Container(s)	3			3			
Deteriorated or damaged	1			1			
container(s) (rusty, dented,	2			2			
or of poor integrity	3			3			
Improper aisle spacing	1			2			
(24" between rows)	2			3			
	3			1			
Improper Labeling	1			2			
(HW, Acc Start date)	2			3			
Container(s) improperly closed	1			1			
	2			2			
Incompatible wastes	1			1			
stored together	2			2			
Poor Housekeeping (debris,	1			1			
general cleanliness)	2			2			
Waste outside of proper	1			1			
storage container	2			2			
SECURITY FENCING							
Holes, breaks, gaps in facility	1			1			
fencing, allowing entry	2			2			
EMERGENCY & SPILL							
CONTROL EQUIPMENT	1			1			
(doghouse at East Pad corner)	2			2			
Listed equipment missing	3			3			
COMMUNICATONS							
SYSTEMS	1			1			
Telephone system disabled	2			2			
Hand-held radios unavailable	3						
Portable phones unavailable							
NEW DIKE AREA							
Cracks, erosion or other	1			1			
deterioration to dike	2			2			
walls, corners or joints							

Hukill Chemical Corporation

Drum Inventory

Exhibit F-10

ManID	Profile	Customer	Generator	J. Order	Type	Hukill	OTSD	Total	Process Code	NR	Location	Date Accept
67166	10316	St. Ives - Clevelan	St Ives Inc. Clevelan		DM	0	4	4	C,L,DS,SO,LF40	☑	Non Reg	7/12/2005
67470	14588	Direct Billing	Solvents & Petroleu		DM	1	0	1	S,Q,PL,SO,SR70	☐	Hazardous	8/18/2005
67769	16369	Granite Environm	Borregaard Synthesi		DF	0	2	2	S,B,SG,SO,AB80	☑	Non Reg	9/13/2005
68034	16412	Direct Billing	Penn Manufacturing		DM	0	1	1	C,I,SL,SO,IN30	☑	Non Reg	9/21/2005
68047	16421	Enviromatrix, Inc.	Ricerca	7217	DM	7	0	7	C,R,PL,JO,SR70	☐	Hazardous	9/23/2005
68047	16423	Enviromatrix, Inc.	Ricerca	7220	DM	2	0	2	C,R,PL,JO,SR70	☐	Hazardous	9/23/2005
68051	15198	Environmental Str	Plasti-Paint, Inc.		DM	0	2	2	C,O,SL,SO,SF20	☐	Hazardous	9/30/2005
68126	16421	Enviromatrix, Inc.	Ricerca	7241	DM	4	0	4	C,R,PL,JO,SR70	☐	Hazardous	10/4/2005
68323	9858	Direct Billing	Hotz Environmental		DM	0	7	7	C,F,DM,DI,CF10	☑	Dock Area	10/27/2005
68365	16501	Direct Billing	Lang Equipment Co.		DM	0	1	1	C,B,SH,SO,AB80	☐	Hazardous	10/29/2005
68652	16421	Enviromatrix, Inc.	Ricerca	7479	DM	2	0	2	C,R,PL,JO,SR70	☐	Hazardous	12/3/2005
68652	16424	Enviromatrix, Inc.	Ricerca	7478	DM	3	0	3	C,R,PL,JO,SR70	☐	Hazardous	12/3/2005
68652	16422	Enviromatrix, Inc.	Ricerca	7480	DM	1	0	1	C,R,PL,JO,SR70	☐	Hazardous	12/3/2005
68652	16423	Enviromatrix, Inc.	Ricerca	7477	DM	1	0	1	C,R,PL,JO,SR70	☐	Hazardous	12/3/2005
68846	5510	Direct Billing	Luke Engineering &		DF	0	2	2	S,A,PM,SO,AB80	☐	Hazardous	12/16/2005
68874	16523	Direct Billing	Advanced Painting		DM	0	1	1	H,I,SL,SO,AB80	☐	Hazardous	2/16/2006
68918	2020	Direct Billing	Kannenberg Brother		DM	1	0	1	C,Q,PL,SO,SR70	☑	Non Reg	12/15/2005
68959	2521	Direct Billing	Ashland Specialty C		DM	2	0	2	S,R,PL,RH,SR70	☐	Hazardous	1/6/2006
69121	9858	Direct Billing	Hotz Environmental		DM	0	1	1	C,F,DM,DI,CF10	☑	Non Reg	1/19/2006
69196	16647	Enviromatrix, Inc.	Ricerca	7683	DM	17	0	17	C,R,PL,JO,SR70	☑	NR East Pad	1/21/2006
69196	16423	Enviromatrix, Inc.	Ricerca	7682	DM	6	0	6	C,R,PL,JO,SR70	☑	NR East Pad	1/21/2006
69207	2020	Direct Billing	Kannenberg Brother		DM	1	0	1	C,Q,PL,SO,SR70	☑	Non Reg	1/18/2006
69371	7746	Direct Billing	Keywell-Vac Air Al		DM	0	1	1	C,O,SL,SO,SF20	☐	Hazardous	2/16/2006
69424	8066	Direct Billing	Hope's Windows, In		DM	0	3	3	C,L,SH,SO,LF40	☑	Non Reg	2/17/2006
69431	16592	Direct Billing	K P McNamara		DM	0	1	1	C,F,PL,PP,CF10	☐	Hazardous	2/17/2006
69451	16673	GTI, Inc.	Heller & Usdan		DM	0	1	1	S,L,SG,SO,AB80	☐	Hazardous	2/24/2006
69469	16623	Direct Billing	Great Lakes Constru		DF	0	1	1	S,I,PD,SO,IN30	☐	Hazardous	2/24/2006
69470	16699	Direct Billing	Great Lakes Constru		DM	0	1	1	S,I,PD,SO,IN30	☐	Hazardous	2/24/2006
69482	15404	Direct Billing	Vexor Technologies	7799	DM	12	0	12	C,R,PL,RH,SR70	☑	Non Reg	2/23/2006
69490	2020	Direct Billing	Kannenberg Brother		DF	1	0	1	C,Q,PL,SO,SR70	☑	Non Reg	2/23/2006
69498	2521	Direct Billing	Ashland Specialty C		DM	9	0	9	S,R,PL,RH,SR70	☐	Hazardous	3/7/2006
69518	16721	Resource Recover	Recyclean Plastics	7810	DM	3	0	3	C,R,PL,ER,SR70	☑	Non Reg	2/24/2006
69582	16707	Direct Billing	Abbott Laboratories	7848	DM	16	0	16	C,R,PL,RH,SR70	☐	East Wareh	3/29/2006
69591	12338	Direct Billing	Chem Technologies,		DM	0	8	8	C,O,SG,SO,SF20	☑	Non Reg	3/9/2006
69602	16728	Direct Billing	Touchstone Designs		DM	0	1	1	S,I,PL,SO,IN30	☐	East Wareh	3/9/2006
69620	16676	American Waste	Republic Engineere		DF	0	1	1	S,A,SG,SO,AB80	☐	East Wareh	3/16/2006
69656	5874	Direct Billing	Custom Engineering		DM	0	1	1	C,O,SP,AG,SF20	☐	East Wareh	3/17/2006
69664	11346	Granite Environm	PCI Synthesis Inc.		DM	24	0	24	C,F,PL,PP,CF10	☐	East Wareh	3/16/2006
69669	16653	Tonawanda Envir	Iimak		DM	0	2	2	S,I,DD,SO,IN30	☑	NR East Pad	3/16/2006
69704	2020	Direct Billing	Kannenberg Brother		DM	1	0	1	C,Q,PL,SO,SR70	☑	East Wareh	3/18/2006
69754	2020	Direct Billing	Kannenberg Brother		DM	2	0	2	C,Q,PL,SO,SR70	☑	East Wareh	4/17/2006
69756	16755	Direct Billing	Touchstone Designs		DF	0	1	1	S,I,PL,SO,AB80	☐	East Wareh	3/28/2006
69759	2020	Direct Billing	Kannenberg Brother		DM	1	0	1	C,Q,PL,SO,SR70	☑	Dock Area	3/24/2006
69770	16422	Enviromatrix, Inc.	Ricerca	7934	DM	20	0	20	C,R,PL,JO,SR70	☑	NR East Pad	4/5/2006
69770	16647	Enviromatrix, Inc.	Ricerca	7933	DM	1	0	1	C,R,PL,JO,SR70	☑	NR East Pad	4/5/2006
69770	16773	Enviromatrix, Inc.	Ricerca	7932	DM	15	0	15	C,R,PL,JO,SR70	☑	NR East Pad	4/5/2006
69770	16774	Enviromatrix, Inc.	Ricerca	7931	DM	3	0	3	C,R,PL,JO,SR70	☑	NR East Pad	4/5/2006
69771	6415	Direct Billing	Fomo Products		TP	2	0	2	C,F,PM,PP,CF10	☑	NR East Pad	3/30/2006
69783	2366	Direct Billing	Commonwealth Alu	7949	DM	8	0	8	C,R,PL,RL,SR70	☐	East Wareh	4/4/2006
69785	16775	Enviromatrix, Inc.	Ricerca	7930	DM	2	0	2	C,R,PL,JO,SR70	☑	NR East Pad	4/5/2006

ManID	Profile	Customer	Generator	J. Order	Type	Hukill	OTSD	Total	Process Code	NR	Location	Date Accept
69786	16653	Tonawanda Envir	Iimak		DM	0	2	2	S,I,DD,SO,IN30	☑	NR East Pad	3/30/2006
69788	5960	Tonawanda Envir	Iimak		DM	0	9	9	C,O,SL,SO,SF20	☐	No Free Liqı	5/2/2006
69830	2020	Direct Billing	Kannenberg Brother		DM	1	0	1	C,Q,PL,SO,SR70	☑	East Wareho	4/4/2006
69831	11218	Granite Environm	PCI Synthesis Inc.		DF	0	2	2	C,O,SL,SO,SF20	☐	No Free Liqı	4/5/2006
69863	8382	Direct Billing	Grafika Commercial		DM	1	0	1	C,Z,PL,BT,HW50	☑	NR East Pad	4/11/2006
69868	16792	Direct Billing	Brenntag Northeast,		DM	0	1	1	C,F,DS,DI,CF10	☑	NR East Pad	4/12/2006
69895	16796	Vexor Technology	Delaware Mosquito		DF	0	2	2	H,I,PL,SO,IN30	☐	East Wareho	4/13/2006
69898	16653	Tonawanda Envir	Iimak		DM	0	2	2	S,I,DD,SO,IN30	☑	NR East Pad	4/13/2006
69902	12482	Solvent Systems I	C F M Companies	7979	DM	1	0	1	C,R,PL,RL,SR70	☐	Dock Area	4/12/2006
69909	8379	Direct Billing	Chiyoda America, I		DM	1	0	1	C,F,DS,DI,CF10	☐	East Wareho	4/19/2006
69916	12455	Direct Billing	Baum Printing		CF	0	2	2	C,RY,SL,SO,SS00	☑	Universal	4/19/2006
69930	15198	Environmental Str	Plasti-Paint, Inc.		DM	0	1	1	C,O,SL,SO,SF20	☐	No Free Liqı	5/13/2006
69939	12574	Direct Billing	U S Can Company 0		CF	0	2	2	C,RY,SL,SO,SS00	☑	Universal	4/19/2006
69945	6516	Direct Billing	Bedford Materials C		DM	0	4	4	C,O,SH,SO,SF20	☐	East Wareho	4/25/2006
69945	6514	Direct Billing	Bedford Materials C		DM	0	3	3	C,F,PL,PP,CF10	☐	East Wareho	4/25/2006
69957	16067	Resource Manage	Ceramtec	7991	DM	5	0	5	C,R,PL,ER,SR70	☐	East Wareho	4/18/2006
69958	16716	Direct Billing	K P McNamara		TP	0	1	1	S,A,PM,DI,CF10	☐	East Wareho	4/20/2006
69983	16081	Direct Billing	Lake Metroparks		CF	0	5	5	C,RY,SL,SO,SS00	☑	Universal	4/21/2006
69983	16080	Direct Billing	Lake Metroparks		DF	0	1	1	C,RY,SH,SO,SS00	☑	Universal	4/21/2006
69984	12338	Direct Billing	Chem Technologies,		DM	0	23	23	C,O,SG,SO,SF20	☑	NR East Pad	5/1/2006
69996	15102	Solvent Systems I	Apollo Plastic Corp	8196	DM	3	0	3	C,R,PL,JO,SR70	☐	East Wareho	6/14/2006
70008	15867	Direct Billing	Ferro Corporation		CF	0	1	1	C,RY,SL,SO,SS00	☑	Universal	4/25/2006
70010	15386	Direct Billing	K P McNamara		DM	0	8	8	C,L,PL,SO,LF40	☑	NR East Pad	4/26/2006
70032	16112	Direct Billing	Tameran Graphic Sy		CF	0	10	10	C,RY,SL,SO,SS00	☑	Universal	5/1/2006
70032	16112	Direct Billing	Tameran Graphic Sy		CF	0	3	3	C,RY,SL,SO,SS00	☑	Universal	5/1/2006
70033	8975	Solvent Systems I	Kuhn Knight, Inc.		DM	0	14	14	C,F,PL,PP,CF10	☐	East Wareho	4/26/2006
70096	13347	Direct Billing	Tube Methods		DM	8	0	8	C,F,PL,PP,CF10	☐	East Wareho	5/5/2006
70109	16543	Direct Billing	Sterling Die Inc.		CF	0	3	3	C,RY,SL,SO,SS00	☑	Universal	5/5/2006
70110	16839	Direct Billing	Custom Interior Ent		DM	0	6	6	C,O,SL,SO,SF20	☐	No Free Liqı	5/5/2006
70111	15347	Direct Billing	Masterbrand Cabine	8054	DM	18	0	18	C,R,PL,JO,SR70	☐	East Wareho	5/10/2006
70112	11574	Direct Billing	Adhesives Research		DM	0	1	1	C,O,SL,SO,SF20	☐	East Wareho	5/10/2006
70125	15293	Direct Billing	Stoner Inc.		DM	0	1	1	C,O,SH,SO,IN30	☐	East Wareho	5/11/2006
70130	16862	Direct Billing	Capital Resin Corpo		DM	80	0	80	C,Z,PL,SO,HW50	☑	NR East Pad	5/5/2006
70134	16884	Ashland Chemical	Ashland Chemical C		DM	0	1	1	S,A,PL,SO,AB80	☐	East Wareho	5/5/2006
70135	11218	Granite Environm	PCI Synthesis Inc.		DM	0	5	5	C,O,SL,SO,SF20	☐	No Free Liqı	5/2/2006
70138	15198	Environmental Str	Plasti-Paint, Inc.		DM	0	1	1	C,O,SL,SO,SF20	☐	No Free Liqı	5/13/2006
70144	9016	Solvent Systems I	Libra Industries		TP	2	0	2	C,F,DM,DI,CF10	☐	East Wareho	5/4/2006
70158	13566	Tonawanda Envir	Alstom - HMS		DM	0	1	1	C,O,SL,SO,SF20	☐	East Wareho	5/11/2006
70160	13569	Tonawanda Envir	Alstom - HCS		CF	0	1	1	C,O,SL,SO,SF20	☐	East Wareho	5/11/2006
70168	16794	Direct Billing	Brenntag Northeast,		DM	0	32	32	S,L,SG,SO,AB80	☐	East Wareho	5/12/2006
70170	16417	Direct Billing	Arrow International		CF	0	3	3	C,RY,SL,SO,SS00	☑	Universal	5/15/2006
70170	16858	Direct Billing	Arrow International		CF	0	4	4	C,RY,SL,SO,SS00	☑	Universal	5/15/2006
70171	8384	Direct Billing	Grafika Commercial		DM	0	4	4	C,O,SL,SO,SF20	☐	No Free Liqı	5/12/2006
70173	1465	Direct Billing	Williams Metal Fini		DM	0	1	1	C,O,SP,SO,SF20	☐	East Wareho	5/13/2006
70182	8381	Direct Billing	Chiyoda America, I		DM	0	4	4	C,O,SL,SO,SF20	☐	No Free Liqı	5/13/2006
70188	15794	Affinity Consulta	Will-Burt Company		CF	0	7	7	C,RY,SL,SO,SS00	☑	Universal	5/13/2006
70189	15794	Affinity Consulta	Will-Burt Company		CF	0	1	1	C,RY,SL,SO,SS00	☑	Universal	5/11/2006
70189	15795	Affinity Consulta	Will-Burt Company		CF	0	1	1	C,RY,SL,SO,SS00	☑	Universal	5/11/2006
70190	5652	Affinity Consulta	Will-Burt Company		DM	0	1	1	C,O,SL,SO,SF20	☐	No Free Liqı	5/11/2006
70191	5732	Affinity Consulta	Will-Burt Company		DM	0	1	1	C,O,SL,SO,SF20	☐	No Free Liqı	5/11/2006
70197	12338	Direct Billing	Chem Technologies,		DM	0	20	20	C,O,SG,SO,SF20	☑	NR East Pad	5/10/2006
70200	12922	Ameriwaste Envir	Budzar Industries In		DM	0	4	4	C,O,SL,SO,SF20	☐	No Free Liqı	5/13/2006
70202	5960	Tonawanda Envir	Iimak		DM	0	10	10	C,O,SL,SO,SF20	☐	No Free Liqı	5/11/2006
204	5960	Tonawanda Envir	Iimak		DM	0	9	9	C,O,SL,SO,SF20	☐	Dock Area	6/7/2006

ManID	Profile	Customer	Generator	J. Order	Type	Hukill	OTSD	Total	Process Code	NR	Location	Date Accept
70205	16653	Tonawanda Envir	Iimak		DM	0	3	3	S,I,DD,SO,IN30	☑	NR East Pad	6/22/2006
70205	5960	Tonawanda Envir	Iimak		DM	0	9	9	C,O,SL,SO,SF20	☐	No Free Liqı	6/22/2006
70205	4590	Tonawanda Envir	Iimak		DM	10	0	10	C,F,PL,PP,CF10	☐	East Wareh	6/22/2006
70207	5959	Tonawanda Envir	Iimak		DM	1	0	1	C,F,PL,PP,CF10	☑	East Wareh	5/11/2006
70210	5581	Direct Billing	Primary Packaging,		TP	11	0	11	C,Z,PL,PP,HW50	☑	NR East Pad	5/18/2006
70210	13225	Direct Billing	Primary Packaging,		DM	0	9	9	C,O,SL,SO,SF20	☐	No Free Liqı	5/18/2006
70212	9418	Vexor Technology	F E Myers		DM	0	1	1	C,O,SL,SO,SF20	☐	East Wareh	5/11/2006
70213	2521	Direct Billing	Ashland Specialty C		DM	7	0	7	S,R,PL,RH,SR70	☐	East Wareh	5/19/2006
70216	13468	Direct Billing	Superior Tube Com		DM	1	0	1	S,F,PM,DI,CF10	☐	East Wareh	5/24/2006
70218	13592	Direct Billing	Superior Tube Com		DM	0	2	2	C,O,SP,SO,SF20	☐	East Wareh	5/24/2006
70224	11620	Brenntag Northea	Williamsport Wirer		DM	4	0	4	C,F,PL,PP,CF11	☑	Dock Area	5/13/2006
70245	13248	Ashland Chemical	Alcoa	8176	DM	0	1	1	C,R,PL,ER,SR70	☐	East Wareh	6/9/2006
70247	13248	Ashland Chemical	Alcoa	8234	DM	14	0	14	C,R,PL,ER,SR70	☐	East Wareh	6/23/2006
70254	15198	Environmental Str	Plasti-Paint, Inc.		DM	0	1	1	C,O,SL,SO,SF20	☐	No Free Liqı	5/13/2006
70257	11945	Direct Billing	K P McNamara		DM	0	1	1	C,L,SP,SO,LF40	☑	NR East Pad	5/16/2006
70258	2370	Direct Billing	Keywell-Vac Air Al		DM	0	1	1	C,F,DS,DI,SF20	☐	East Wareh	5/19/2006
70258	2372	Direct Billing	Keywell-Vac Air Al		DM	9	0	9	C,F,PL,PP,CF10	☐	East Wareh	5/19/2006
70260	9858	Direct Billing	Hotz Environmental		DM	0	8	8	C,F,DM,DI,CF10	☑	Dock Area	5/18/2006
70263	12455	Direct Billing	Baum Printing		CF	0	5	5	C,RY,SL,SO,SS00	☑	Universal	5/24/2006
70273	14773	Vexor Technology	Simon Roofing & S		BA	0	4	4	C,O,SH,SO,SF20	☐	East Wareh	5/18/2006
70274	16877	Direct Billing	Dayton Freight Line		DM	1	0	1	S,F,PL,PP,CF10	☐	East Wareh	5/16/2006
70274	16878	Direct Billing	Dayton Freight Line		DM	0	1	1	C,F,PD,PP,CF10	☐	East Wareh	5/16/2006
70280	15086	Direct Billing	Solvents & Petroleu		DM	0	1	1	C,O,SL,SO,SF20	☐	No Free Liqı	5/18/2006
70280	15087	Direct Billing	Solvents & Petroleu		DM	0	1	1	C,O,SH,SO,SF20	☐	No Free Liqı	5/18/2006
70281	16851	Direct Billing	Solvents & Petroleu		DM	0	1	1	C,L,SL,SO,LF40	☐	East Wareh	5/18/2006
70282	4944	Direct Billing	Solvents & Petroleu		DM	0	2	2	C,F,SP,DI,CF10	☐	East Wareh	5/18/2006
70282	16863	Direct Billing	Solvents & Petroleu		DM	0	3	3	C,O,SL,SO,SF20	☐	No Free Liqı	5/18/2006
70282	16863	Direct Billing	Solvents & Petroleu		DF	0	2	2	C,O,SL,SO,SF20	☐	No Free Liqı	5/18/2006
70283	13479	Direct Billing	Solvents & Petroleu		DM	3	0	3	C,E,PL,ER,SR70	☐	East Wareh	5/18/2006
70283	8636	Direct Billing	Solvents & Petroleu		DF	6	0	6	S,F,PL,PP,CF10	☐	East Wareh	5/18/2006
70287	16346	Solvents & Petrol	Bergeron Health Car		DM	0	1	1	S,I,SH,SO,IN30	☐	East Wareh	5/18/2006
70300	12482	Solvent Systems I	C F M Companies	8094	DM	5	0	5	C,R,PL,RL,SR70	☐	East Wareh	5/17/2006
70312	16238	Corrosion Prevent	RFD Beaufort Inc.		DM	0	2	2	C,F,SL,SO,SF20	☐	No Free Liqı	5/26/2006
70312	16239	Corrosion Prevent	RFD Beaufort Inc.		DM	0	4	4	C,F,SL,SO,SF20	☐	No Free Liqı	5/26/2006
70312	16241	Corrosion Prevent	RFD Beaufort Inc.		DM	0	3	3	C,O,SL,SO,SF20	☐	No Free Liqı	5/26/2006
70318	10100	New Age Environ	Centria		DM	0	2	2	C,O,SP,SO,SF20	☐	East Wareh	5/18/2006
70319	16707	Direct Billing	Abbott Laboratories	8102	DM	13	0	13	C,R,PL,RH,SR70	☐	East Wareh	5/24/2006
70321	13118	Direct Billing	Marsh Bellofram		DF	0	6	6	C,O,SL,SO,SF20	☐	No Free Liqı	5/23/2006
70323	16860	Vexor Technology	Jevic Transportation		DF	0	1	1	S,A,PL,SO,AB80	☐	East Wareh	5/20/2006
70323	16874	Vexor Technology	Jevic Transportation		DM	0	1	1	C,I,PL,SO,IN30	☑	East Wareh	5/20/2006
70327	16902	Direct Billing	Santo Inserra		DM	3	0	3	S,F,PL,PP,CF10	☐	East Wareh	5/19/2006
70341	2130	Direct Billing	Kannenberg Brother		DM	1	0	1	C,F,PL,PP,CF10	☐	East Wareh	5/22/2006
70344	16393	Sheetz, Inc.	Sheetz, Inc.		DM	0	1	1	C,O,SP,SO,SF20	☐	East Wareh	5/30/2006
70344	16394	Sheetz, Inc.	Sheetz, Inc.		DM	5	0	5	C,Z,PL,BT,HW50	☐	East Wareh	5/30/2006
70345	16399	Sheetz, Inc.	Sheetz, Inc.		DM	0	8	8	C,L,SP,SO,SF20	☐	East Wareh	5/30/2006
70346	16388	Sheetz, Inc.	Sheetz, Inc.		DM	0	2	2	C,L,SP,SO,SF20	☐	No Free Liqı	5/30/2006
70349	6583	Direct Billing	Sheetz Incorporated		DM	0	13	13	C,L,SP,SO,SF20	☐	No Free Liqı	5/30/2006
70350	14392	Direct Billing	Sheetz Incorporated		DM	0	2	2	C,F,DM,DI,CF10	☑	Dock Area	5/30/2006
70351	6958	Direct Billing	Shane Felter Ind. In		DM	0	3	3	C,F,PL,PP,CF10	☐	East Wareh	5/30/2006
70352	14236	Sheetz, Inc.	Sheetz, Inc.		DM	0	14	14	C,O,SL,SO,SF20	☐	No Free Liqı	5/30/2006
70353	12167	Direct Billing	CSE Corporation		DM	0	2	2	S,I,SH,SO,SS00	☐	East Wareh	5/30/2006
70359	14081	Farley Company	Hygenic Corporatio		DM	0	2	2	C,O,PL,SO,SF20	☐	East Wareh	6/2/2006
70365	5633	Direct Billing	Hukill Chemical Co		DM	0	2	2	C,O,SH,SO,SF20	☐	East Wareh	5/22/2006
68	15048	Environmental Str	Plasti-Paint, Inc.	8168	DM	8	0	8	C,E,PL,ER,SR70	☐	East Wareh	6/9/2006

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70377	12482	Solvent Systems I	C F M Companies	8119	DM	14	0	14	C,R,PL,RL,SR70	☐	East Wareh	5/24/2006
70389	16494	Direct Billing	UHHS Bedford Med		CF	0	17	17	C,RY,SL,SO,SS00	☑	Universal	5/31/2006
70395	2020	Direct Billing	Kannenberg Brother		DM	1	0	1	C,Q,PL,SO,SR70	☑	East Wareh	5/25/2006
70399	16653	Tonawanda Envir	limak		DM	0	2	2	S,I,DD,SO,IN30	☑	Dock Area	5/25/2006
70403	15312	Vexor Technology	Jevic Transportation		DF	0	1	1	C,O,SH,SO,SF20	☐	East Wareh	5/26/2006
70403	15313	Vexor Technology	Jevic Transportation		DF	0	2	2	S,A,PL,SO,AB80	☐	East Wareh	5/26/2006
70410	15198	Environmental Str	Plasti-Paint, Inc.		DM	0	1	1	C,O,SL,SO,SF20	☐	No Free Liq	5/26/2006
70413	16716	Direct Billing	K P McNamara		TP	1	0	1	S,A,PM,DI,CF10	☐	East Wareh	5/31/2006
70416	15390	Direct Billing	Porter Engineered S		DM	0	1	1	S,F,PD,SO,SF20	☐	East Wareh	6/2/2006
70417	16979	Enviromatrix, Inc.	Ricerca		DM	2	0	2	C,R,PL,JO,SR70	☑	NR East Pad	6/1/2006
70417	16422	Enviromatrix, Inc.	Ricerca	8134	DM	15	0	15	C,R,PL,JO,SR70	☑	NR East Pad	6/1/2006
70417	16774	Enviromatrix, Inc.	Ricerca	8136	DM	6	0	6	C,R,PL,JO,SR70	☑	NR East Pad	6/1/2006
70417	16647	Enviromatrix, Inc.	Ricerca	8137	DM	16	0	16	C,R,PL,JO,SR70	☑	NR East Pad	6/1/2006
70418	16979	Enviromatrix, Inc.	Ricerca		DM	6	0	6	C,R,PL,JO,SR70	☑	NR East Pad	6/1/2006
70418	16775	Enviromatrix, Inc.	Ricerca	8138	DM	15	0	15	C,R,PL,JO,SR70	☑	NR East Pad	6/1/2006
70418	16421	Enviromatrix, Inc.	Ricerca	8139	DM	4	0	4	C,R,PL,JO,SR70	☐	East Wareh	6/1/2006
70418	16773	Enviromatrix, Inc.	Ricerca		DM	6	0	6	C,R,PL,JO,SR70	☑	NR East Pad	6/1/2006
70424	2020	Direct Billing	Kannenberg Brother		DM	2	0	2	C,Q,PL,SO,SR70	☑	East Wareh	6/1/2006
70433	16384	Brandywine Reco	VI-JON Laboratorie	8165	DM	64	0	64	C,R,PL,JO,SR70	☑	Dock Area	6/7/2006
70435	14158	Vexor Technology	Shiloh Ohio Welded		DM	0	1	1	C,I,SL,SO,AB80	☐	East Wareh	6/2/2006
70438	15867	Direct Billing	Ferro Corporation		CF	0	1	1	C,RY,SL,SO,SS00	☑	Universal	6/8/2006
70439	9311	Direct Billing	Ferro Corporation		DM	0	2	2	C,L,PL,SO,LF40	☑	NR East Pad	6/8/2006
70442	15347	Direct Billing	Masterbrand Cabine		DM	19	0	19	C,R,PL,JO,SR70	☐	East Wareh	6/9/2006
70443	11573	Direct Billing	Adhesives Research		DM	10	1	11	C,F,PM,DI,CF10	☐	East Wareh	6/9/2006
70443	11574	Direct Billing	Adhesives Research		DM	0	2	2	C,O,SL,SO,SF20	☐	East Wareh	6/9/2006
70444	15967	Direct Billing	Adhesives Research		DF	0	2	2	C,L,SL,SO,LF40	☑	Dock Area	6/9/2006
70445	13595	Direct Billing	Adhesives Research		DM	0	1	1	C,I,DM,SO,IN30	☑	Dock Area	6/9/2006
70446	10100	New Age Environ	Centria		DM	0	8	8	C,O,SP,SO,SF20	☐	East Wareh	6/14/2006
70450	8386	Direct Billing	Grafika Commercial		DM	2	0	2	C,F,PL,PP,CF10	☐	East Wareh	6/9/2006
70450	8384	Direct Billing	Grafika Commercial		DM	0	4	4	C,O,SL,SO,SF20	☐	East Wareh	6/9/2006
70450	8382	Direct Billing	Grafika Commercial		DM	5	0	5	C,Z,PL,BT,HW50	☑	NR East Pad	6/9/2006
70451	15851	Direct Billing	Grafika Commercial		DM	0	1	1	C,F,PM,DI,CF10	☐	East Wareh	6/9/2006
70451	11927	Direct Billing	Grafika Commercial		CF	0	2	2	C,RY,SL,SO,SS00	☑	Universal	6/9/2006
70452	16220	Direct Billing	R M Palmer Compa		CF	0	1	1	C,RY,SH,SO,SS00	☑	Universal	6/9/2006
70453	5038	Direct Billing	Reidler Decal Corpo		DM	0	3	3	C,O,SH,SO,SF20	☐	Dock Area	6/9/2006
70455	16892	Direct Billing	Glen-Gery Corporati		DM	2	0	2	C,F,PM,DI,CF10	☐	East Wareh	6/9/2006
70456	2366	Direct Billing	Commonwealth Alu	8158	DM	13	0	13	C,R,PL,RL,SR70	☐	East Wareh	6/5/2006
70458	7294	Direct Billing	Tremco Incorporate		DM	0	7	7	S,L,PM,SO,LF40	☑	NR East Pad	6/9/2006
70459	16895	Direct Billing	H.C. Starck Fabricat		DM	0	7	7	C,L,SP,SO,LF40	☑	Dock Area	6/15/2006
70460	16643	Direct Billing	The Timken Compa		DM	0	7	7	C,L,SP,SO,LF40	☑	Dock Area	6/14/2006
70461	1618	Ashland Chemical	Sonoco Flexible Pac	8174	DM	0	1	1	C,R,PL,PP,SR70	☐	East Wareh	6/9/2006
70463	11004	Resource Manage	Shakespeare Corp.	8161	DM	4	0	4	C,E,PL,ER,SR70	☐	East Wareh	6/13/2006
70463	11003	Resource Manage	Shakespeare Corp.		DM	0	7	7	C,F,DM,DI,CF10	☐	East Wareh	6/13/2006
70465	16967	Direct Billing	Day International		CF	0	2	2	C,L,SP,SO,LF40	☑	'est Warehou	6/9/2006
70465	16967	Direct Billing	Day International		DF	0	2	2	C,L,SP,SO,LF40	☑	NR East Pad	6/9/2006
70465	16968	Direct Billing	Day International		DM	0	2	2	H,A,PL,SO,AB80	☐	East Wareh	6/9/2006
70465	16969	Direct Billing	Day International		DF	0	1	1	S,I,PL,SO,AB80	☐	East Wareh	6/9/2006
70468	9549	Direct Billing	Hotz Environmental		DM	0	3	3	S,F,PM,DI,CF10	☐	Dock Area	6/9/2006
70468	9858	Direct Billing	Hotz Environmental		DM	45	0	45	C,F,DM,DI,CF10	☑	NR East Pad	6/9/2006
70470	16982	Enviromatrix, Inc.	Ricerca		DM	8	0	8	C,R,PL,MS,SR70	☑	NR East Pad	6/8/2006
70470	16981	Enviromatrix, Inc.	Ricerca		DM	3	0	3	C,R,PL,MS,SR70	☑	NR East Pad	6/8/2006
70470	16423	Enviromatrix, Inc.	Ricerca		DM	2	0	2	C,R,PL,JO,SR70	☑	NR East Pad	6/8/2006
70470	16980	Enviromatrix, Inc.	Ricerca		DM	2	0	2	C,R,PL,MS,SR70	☑	NR East Pad	6/8/2006
71	16647	Enviromatrix, Inc.	Ricerca		DM	6	0	6	C,R,PL,JO,SR70	☑	Dock Area	6/8/2006

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70471	16422	Enviromatrix, Inc.	Ricerca		DM	3	0	3	C,R,PL,JO,SR70	☑	Dock Area	6/8/2006
70471	16773	Enviromatrix, Inc.	Ricerca		DM	2	0	2	C,R,PL,JO,SR70	☑	NR East Pad	6/8/2006
70471	16979	Enviromatrix, Inc.	Ricerca		DM	8	0	8	C,R,PL,JO,SR70	☑	NR East Pad	6/8/2006
70473	10243	American Waste	The Timken Compa		DF	0	4	4	S,A,PL,SO,AB80	☐	East Wareh	6/15/2006
70474	16939	Solvent Systems I	Potlatch		DM	0	1	1	C,F,PM,DI,CF10	☐	East Wareh	6/6/2006
70481	16876	Solvent Systems I	Acme Finishing		DF	0	6	6	S,A,PL,SO,AB80	☐	East Wareh	6/6/2006
70482	9016	Solvent Systems I	Libra Industries		TP	2	0	2	C,F,DM,DI,CF10	☐	East Wareh	6/6/2006
70483	12482	Solvent Systems I	C F M Companies	8167	DM	10	0	10	C,R,PL,RL,SR70	☐	East Wareh	6/6/2006
70484	15386	Direct Billing	K P McNamara		DM	0	11	11	C,L,PL,SO,LF40	☑	NR East Pad	6/9/2006
70484	15386	Direct Billing	K P McNamara		TP	0	4	4	C,L,PL,SO,LF40	☑	NR East Pad	6/9/2006
70493	9408	Direct Billing	Maval Manufacturin		DM	0	2	2	C,L,SG,SO,LF40	☑	NR East Pad	6/13/2006
70498	15102	Solvent Systems I	Elkhorn Collision C		DM	1	0	1	C,R,PL,JO,SR70	☐	East Wareh	6/6/2006
70525	14812	GTI, Inc.	Pharmatech		DM	1	0	1	C,F,PL,PP,CF10	☐	East Wareh	6/14/2006
70526	5771	Direct Billing	Ellison Bronze		DM	0	2	2	C,L,SG,SO,LF40	☐	East Wareh	6/16/2006
70531	16974	Direct Billing	Day International		DM	0	1	1	S,A,PD,SO,AB80	☐	East Wareh	6/9/2006
70535	16708	Direct Billing	POV Printing		DM	0	4	4	C,L,PL,SO,LF40	☑	Dock Area	6/15/2006
70536	16384	Brandywine Reco	VI-JON Laboratorie	8206	DM	61	0	61	C,R,PL,JO,SR70	☑	Dock Area	6/16/2006
70538	14372	Direct Billing	Dawson Metals Co		DM	0	3	3	C,L,SH,SO,LF40	☐	No Free Liqı	6/16/2006
70539	16135	Ameriwaste Envir	Metal Coatings Inter		DM	7	0	7	C,Z,PL,SO,HW50	☐	East Wareh	6/15/2006
70540	7303	Direct Billing	A P V Incorporated		DM	0	7	7	C,O,SH,SO,SF20	☐	East Wareh	6/13/2006
70540	7302	Direct Billing	A P V Incorporated		DM	0	8	8	C,O,SH,SO,SF20	☐	East Wareh	6/13/2006
70541	8636	Direct Billing	Solvents & Petroleu		DM	4	0	4	S,F,PL,PP,CF10	☐	East Wareh	6/13/2006
70543	10588	Direct Billing	Solvents & Petroleu		DM	0	2	2	C,F,PM,DI,CF10	☐	East Wareh	6/13/2006
70544	13479	Direct Billing	Solvents & Petroleu		DM	2	0	2	C,E,PL,ER,SR70	☐	East Wareh	6/13/2006
70544	13542	Direct Billing	Solvents & Petroleu		DM	3	0	3	C,F,PL,PP,CF10	☐	East Wareh	6/13/2006
70545	13709	Direct Billing	Solvents & Petroleu		DM	0	5	5	S,O,DS,SO,AB80	☐	East Wareh	6/13/2006
70546	16094	Direct Billing	Solvents & Petroleu		DM	0	3	3	C,L,SP,SO,LF40	☑	Dock Area	6/13/2006
70547	16183	Solvents & Petrol	Upstate Laboratorie		DF	0	2	2	S,A,PL,SO,AB80	☐	East Wareh	6/13/2006
70553	2020	Direct Billing	Kannenberg Brother		DM	3	0	3	C,Q,PL,SO,SR70	☑	NR East Pad	6/9/2006
70554	2020	Direct Billing	Kannenberg Brother		DM	1	0	1	C,Q,PL,SO,SR70	☑	NR East Pad	6/9/2006
70561	15048	Environmental Str	Plasti-Paint, Inc.		DM	10	0	10	C,E,PL,ER,SR70	☐	East Wareh	6/9/2006
70564	14658	Direct Billing	CardPak, Inc.		DF	0	6	6	C,L,PL,SO,LF40	☑	'est Warehou:	6/15/2006
70564	14660	Direct Billing	CardPak, Inc.		DM	0	1	1	C,L,DM,SO,LF40	☑	'est Warehou:	6/15/2006
70565	17005	New Age Environ	Bradley Coatings Gr		DM	0	1	1	C,O,SL,SO,SF20	☐	East Wareh	6/16/2006
70565	16319	New Age Environ	Bradley Coatings Gr		DM	0	1	1	S,I,PL,SO,IN30	☐	East Wareh	6/16/2006
70585	12338	Direct Billing	Chem Technologies,		DM	0	24	24	C,O,SG,SO,SF20	☑	NR East Pad	6/21/2006
70585	12336	Direct Billing	Chem Technologies,		DM	1	0	1	C,F,PL,PP,CF10	☑	NR East Pad	6/21/2006
70585	12339	Direct Billing	Chem Technologies,		DM	0	3	3	C,O,SP,SO,SF20	☑	NR East Pad	6/21/2006
70589	16997	White Birch Envir	Keywell Industries,		DM	0	3	3	C,L,SL,SO,LF40	☑	East Wareh	6/21/2006
70591	4944	Direct Billing	Solvents & Petroleu		DM	6	0	6	C,F,SP,DI,CF10	☐	East Wareh	6/23/2006
70592	10233	American Waste	The Timken Compa		DF	0	1	1	S,A,PL,SO,AB80	☐	East Wareh	6/15/2006
70593	10231	American Waste	The Timken Compa		DF	0	8	8	S,A,PL,SO,AB80	☐	East Wareh	6/15/2006
70594	6896	Direct Billing	Custom Engineering		DM	1	0	1	C,F,PL,PP,CF10	☐	East Wareh	6/16/2006
70595	15752	Direct Billing	Venango Machine C		TP	1	0	1	C,W,PL,SO,WW60	☑	NR East Pad	6/16/2006
70597	14311	Ameriwaste Envir	Time & Again Reno		DF	1	0	1	S,F,DM,DI,CF10	☐	East Wareh	6/20/2006
70598	13518	Direct Billing	W R E/Colortech		CF	0	1	1	C,Q,RY,SO,SS00	☑	Universal	6/16/2006
70599	5581	Direct Billing	Primary Packaging,		TP	8	0	8	C,Z,PL,PP,HW50	☑	NR East Pad	6/20/2006
70599	13225	Direct Billing	Primary Packaging,		DM	0	6	6	C,O,SL,SO,SF20	☐	East Wareh	6/20/2006
70599	13224	Direct Billing	Primary Packaging,		DM	0	6	6	C,L,SL,SO,LF40	☑	NR East Pad	6/20/2006
70602	12808	Direct Billing	K P McNamara		DM	0	1	1	C,F,PL,PP,CF10	☐	East Wareh	6/16/2006
70602	15386	Direct Billing	K P McNamara		DM	0	10	10	C,L,PL,SO,LF40	☑	NR East Pad	6/16/2006
70602	15386	Direct Billing	K P McNamara		TP	0	2	2	C,L,PL,SO,LF40	☑	NR East Pad	6/16/2006
70603	17006	New Age Environ	Bradley Coatings Gr		DM	0	4	4	C,O,PD,SO,SF20	☐	East Wareh	6/16/2006
03	17007	New Age Environ	Bradley Coatings Gr	8210	DM	0	3	3	C,F,PM,DI,CF10	☐	East Wareh	6/16/2006

ManID	Profile	Customer	Generator	J. Order	Type	Hukill	OTSD	Total	Process Code	NR	Location	Date Accept
70603	16059	New Age Environ	Bradley Coatings Gr		DM	0	1	1	C,F,PM,DI,CF10	☐	East Wareho	6/16/2006
70603	17008	New Age Environ	Bradley Coatings Gr	8209	DM	28	0	28	C,E,PL,JO,SR70	☐	East Wareho	6/16/2006
70608	15658	Vexor Technology	Wilkinson Hi-Rise,		DM	3	0	3	C,F,PL,PP,CF10	☐	East Wareho	6/16/2006
70610	15102	Solvent Systems I	Quality Auto Inc.		DM	1	0	1	C,R,PL,JO,SR70	☐	East Wareho	6/14/2006
70612	15102	Solvent Systems I	Gerber Auto- McHe		DM	1	0	1	C,R,PL,JO,SR70	☐	East Wareho	6/14/2006
70614	12482	Solvent Systems I	C F M Companies	8198	DM	13	0	13	C,R,PL,RL,SR70	☐	East Wareho	6/14/2006
70615	15102	Solvent Systems I	Rizza Chevy Body S		DM	3	0	3	C,R,PL,JO,SR70	☐	East Wareho	6/14/2006
70616	15102	Solvent Systems I	Auto Truck Inc.		DM	1	0	1	C,R,PL,JO,SR70	☐	East Wareho	6/14/2006
70618	15102	Solvent Systems I	Gerber Auto- Huron		DM	1	0	1	C,R,PL,JO,SR70	☐	East Wareho	6/14/2006
70619	15102	Solvent Systems I	Collision Technique		DM	1	0	1	C,R,PL,JO,SR70	☐	East Wareho	6/14/2006
70620	15102	Solvent Systems I	Ultimate Paint Shop		DM	1	0	1	C,R,PL,JO,SR70	☐	East Wareho	6/14/2006
70621	15102	Solvent Systems I	Checki's Auto Body		DM	1	0	1	C,R,PL,JO,SR70	☐	East Wareho	6/14/2006
70622	15102	Solvent Systems I	Bump City Auto		DM	2	0	2	C,R,PL,JO,SR70	☐	East Wareho	6/14/2006
70624	15102	Solvent Systems I	Gerber Auto- Cicero		DM	1	0	1	C,R,PL,JO,SR70	☐	East Wareho	6/14/2006
70625	15102	Solvent Systems I	Howard Auto Body		DM	2	0	2	C,R,PL,JO,SR70	☐	East Wareho	6/14/2006
70626	15102	Solvent Systems I	Custom Aluminum		DM	3	0	3	C,R,PL,JO,SR70	☐	East Wareho	6/14/2006
70627	16985	Solvent Systems I	Bergstrom Inc.		DM	0	2	2	C,O,SL,SO,SF20	☐	East Wareho	6/14/2006
70631	14086	Waters Edge Envi	Morgan Matroc Inc		DM	1	0	1	C,W,PL,PP,HW50	☐	East Wareho	6/21/2006
70633	14941	Brandywine Reco	H. B. Fuller	8211	TP	14	0	14	C,R,PL,JO,SR70	☑	Dock Area	6/27/2006
70635	16960	American Waste	Specialty Fabricatio		DM	1	6	7	C,F,PM,DI,CF10	☐	East Wareho	6/23/2006
70636	12218	American Waste	Car-Mate Trailer		DM	2	0	2	C,F,PL,PP,CF10	☐	East Wareho	6/23/2006
70637	16984	Environmental Se	PA DCNR Ryerson		DM	2	0	2	C,F,PL,PP,CF10	☐	East Wareho	6/23/2006
70641	16937	Environmental Se	Hiawatha Boulevard		CF	0	2	2	C,O,SL,SO,SF20	☐	East Wareho	6/23/2006
70641	16938	Environmental Se	Hiawatha Boulevard		DM	0	1	1	C,F,PL,PP,CF10	☐	East Wareho	6/23/2006
70642	988	Ashland Chemical	Sherwin Williams 0	8215	DM	14	0	14	C,R,PL,RL,SR70	☐	East Wareho	6/21/2006
70644	2020	Direct Billing	Kannenberg Brother		DM	1	0	1	C,Q,PL,SO,SR70	☑	Dock Area	6/16/2006
70645	16350	Direct Billing	All Type Welding		DM	3	0	3	C,Z,PL,SO,HW50	☑	East Wareho	6/21/2006
70647	16766	American Waste	Republic Engineere		CF	0	1	1	S,B,SG,SO,SS00	☐	East Wareho	6/21/2006
70655	14075	Direct Billing	Chempower Ohio Pr		DM	0	2	2	C,L,SL,SO,LF40	☐	East Wareho	6/21/2006
70655	9815	Direct Billing	Chempower Ohio Pr		TP	1	0	1	C,Z,PL,SO,HW50	☐	East Wareho	6/21/2006
70660	16952	Beta Enviromenta	NOM ROBB LLC/		DF	0	1	1	S,B,PL,SO,AB80	☐	East Wareho	6/22/2006
70660	16951	Beta Enviromenta	NOM ROBB LLC/		DF	0	1	1	C,B,PL,SO,AB80	☐	East Wareho	6/22/2006
70660	16949	Beta Enviromenta	NOM ROBB LLC/		DM	0	2	2	C,LSH,SO,IN30	☐	East Wareho	6/22/2006
70661	16955	Beta Enviromenta	NOM ROBB LLC/		DF	0	1	1	C,B,PL,SO,AB80	☐	East Wareho	6/22/2006
70661	16956	Beta Enviromenta	NOM ROBB LLC/		DF	0	1	1	C,B,PL,SO,AB80	☑	East Wareho	6/22/2006
70661	16954	Beta Enviromenta	NOM ROBB LLC/		DF	0	1	1	C,L,PL,SO,LF40	☑	East Wareho	6/22/2006
70661	16953	Beta Enviromenta	NOM ROBB LLC/		DF	0	1	1	S,A,PL,SO,AB80	☐	East Wareho	6/22/2006
70662	17023	Beta Enviromenta	NOM ROBB LLC/		DM	0	1	1	C,F,PM,DI,CF10	☑	Dock Area	6/22/2006
70663	16341	Direct Billing	Stahl Manufacturing		DM	9	0	9	C,F,PM,DI,CF10	☐	East Wareho	6/22/2006
70664	16944	Direct Billing	Stahl Manufacturing		DM	4	0	4	C,F,PM,DI,CF10	☐	East Wareho	6/22/2006
70665	16880	Direct Billing	Luke Engineering &		DF	0	1	1	C,L,SL,SO,LF40	☑	NR East Pad	6/23/2006
70665	10469	Direct Billing	Luke Engineering &		DF	0	1	1	S,B,DS,SO,AB80	☐	East Wareho	6/23/2006
70665	5515	Direct Billing	Luke Engineering &		DM	2	0	2	C,F,PL,PP,CF10	☐	East Wareho	6/23/2006
70665	11235	Direct Billing	Luke Engineering &		DF	0	8	8	S,A,PL,SO,AB80	☐	East Wareho	6/23/2006
70666	16909	Direct Billing	Luke Engineering &		DF	0	2	2	C,L,PL,SO,LF40	☐	East Wareho	6/23/2006
70667	5509	Direct Billing	Luke Engineering &		DF	0	5	5	C,L,SG,SO,LF40	☑	Dock Area	6/28/2006
70667	5513	Direct Billing	Luke Engineering &		DF	0	1	1	S,L,SG,SO,LF40	☑	Dock Area	6/28/2006
70746	3665	Direct Billing	Penn-Wheeling Clos		DM	10	0	10	S,Z,PL,BT,HW50	☐	Dock Area	6/27/2006
70746	2699	Direct Billing	Penn-Wheeling Clos		DM	2	0	2	C,F,PL,PP,CF10	☐	Dock Area	6/27/2006
70753	8636	Direct Billing	Solvents & Petroleu		DM	10	0	10	S,F,PL,PP,CF10	☐	East Wareho	6/23/2006
70753	13479	Direct Billing	Solvents & Petroleu		DM	3	0	3	C,E,PL,ER,SR70	☐	East Wareho	6/23/2006
70753	11243	Direct Billing	Solvents & Petroleu		DF	11	0	11	C,F,PL,PP,CF10	☐	East Wareho	6/23/2006
70754	4947	Direct Billing	Solvents & Petroleu		DF	1	0	1	C,F,DM,DI,CF10	☐	East Wareho	6/23/2006
754	8636	Direct Billing	Solvents & Petroleu		DF	4	0	4	S,F,PL,PP,CF10	☐	East Wareho	6/23/2006

ManID	Profile	Customer	Generator	J. Order	Type	Hukill	OTSD	Total	Process Code	NR	Location	Date Accept
70754	11243	Direct Billing	Solvents & Petroleu		DM	1	0	1	C,F,PL,PP,CF10	☐	East Wareh	6/23/2006
70754	15664	Direct Billing	Solvents & Petroleu		DF	1	0	1	C,F,PL,PP,CF10	☐	East Wareh	6/23/2006
70755	4998	Direct Billing	Solvents & Petroleu		DM	0	5	5	C,O,SL,SO,SF20	☐	No Free Liq	6/23/2006
70756	15502	Direct Billing	Solvents & Petroleu		DM	2	0	2	C,F,PM,PP,CF10	☑	NR East Pad	6/23/2006
70756	15559	Direct Billing	Solvents & Petroleu		DM	0	3	3	C,L,SL,SO,LF40	☑	NR East Pad	6/23/2006
70759	15386	Direct Billing	K P McNamara		TP	0	5	5	C,L,PL,SO,LF40	☑	Dock Area	6/27/2006
70759	15235	Direct Billing	K P McNamara		DM	1	0	1	S,F,DM,DI,CF10	☐	Dock Area	6/27/2006
70759	12808	Direct Billing	K P McNamara		DM	4	0	4	C,F,PL,PP,CF10	☐	Dock Area	6/27/2006
70759	15386	Direct Billing	K P McNamara		DM	0	12	12	C,L,PL,SO,LF40	☑	Dock Area	6/27/2006
70760	17025	Vexor Technology	Prima Paving		DM	5	0	5	C,F,SP,AG,CF10	☐	East Wareh	6/23/2006
70789	16890	Environmental Se	PA DCNR Evansbur		DM	1	0	1	C,F,PL,PP,CF10	☐	East Wareh	6/23/2006
70796	17021	Environmental Se	Simmers Crane Desi		DF	9	0	9	C,F,PL,PP,CF10	☐	East Wareh	6/27/2006
Non Reg:	808	***Haz***	863			**980**	**691**	**1671**				

Section G
Contingency Plan

Section H
Personnel Training

SECTION H

PERSONNEL TRAINING

H-1a Outline of the Training Program

Hukill Chemical's Training Program, initial and continuing, is set up in both classroom and hands-on formats. Videos, slides, written company procedures and open discussion with handouts and quizzes are incorporated into the program. The contents of the programs are reviewed and updated as laws change, technology changes or our procedures change.

The classroom format incorporates discussion of job duties. Videos are discussed and applicable job related duties are stressed. Hands-on training incorporates safety, efficiency and company procedures. Site tours are conducted as part of initial 24-Hr HAZWOPER training in order to discuss safety/environmental situations. The training program stresses safe and proper handling of hazardous waste and hazardous material, safety precautions in plant, along with indoctrination in paper trail requirements of materials handled.

The "paper trail" refers to the Sample Analysis, Job Cost Sheet, Drum Processing Report, Pick-Up Request and Transfer Ticket that track the identity and disposition of each container or bulk load of hazardous waste. The correct information must be written on the applicable sheets and/or incorporated in the facility ACCESS waste tracking database so the hazardous waste tracking is precise.

I. General training (all employees)

a. Overview of Hukill Chemical: A presentation is given of the daily operations at Hukill Chemical. The areas that would have any hazardous waste or emergency potential are highlighted during the presentation and explained for preventative and reactive procedures. These areas are the permitted areas (including all Drum Processing warehouse activites), the reclamation areas, the hazardous waste container and transport unloading areas, the 90-day container storage area, satellite accumulation areas and the permitted tank storage areas.

b. "Working With Chemicals and Your Health" (Figure H-1): The National Safety Council's series "Working With Chemicals and Your Health" is one of the resources used for assuring a basic familiarity with the precautions for working with chemicals. This

series covers general concepts, solvents, acids, and bases, and toxic metals. Other more recent programs are also used.

c. Evacuation Plan (Figures H-2, -3): The evacuation plan is personalized for the area in which each new employee will be working.

d. Plant Tour (Figure H-4): A plant tour is given to familiarize the new employee with the areas. Particular attention is given to point out emergency equipment, doorways, and fire alarm safety pulls . Process systems are explained and the importance of operating equipment to minimize waste or releases is stressed.

e. Contingency Plan (Section G): The Contingency Plan is reviewed with the employee.

f. A new employee must complete all phases of training as described in OAC 3745-54-16 (40 CFR 264.16(b)) in the first 6 months of employment and before working unsupervised with Hazardous Wastes.

g. A copy of the recent "8 Hour" Hazwoper Refresher Training outline (April 2004) is attached as Figure 26 to show the typical training program provided to the personnel involved in the handling and recordkeeping of hazardous waste in the plant. This is an example only and the outline may be changed as necessary to comply with changes in the rules and regulations and changes in plant operating procedures. For the 2004 training you will note DOT compliance was also covered to ensure compliance with these regulations (training every two years). The training for office personnel will not include some of the plant oriented training.

h. Any updates in procedures, rules and regulations within the past year and their impact on daily operations will be reviewed with the trainees.

II. Management Personnel are given both initial and annual training, only if previous experience indicates that training is necessary. When necessary:

a. Initial training for management is designed to formalize the procedures at Hukill Chemical for supervising employees who might handle hazardous waste, and the documenting of handling hazardous waste. These management employees would be stepped through:
   1. The Operating Record Plan. (Collection and storage of permit related operating records.)
   2. The Contingency Plan. (Found in Section G of this permit.)
   3. Emergency Procedures. (A review of information found in Section F of this permit.)
   4. Safety Program. (A review of HCC's Health and Safety Plan.)

b. The annual review will be conducted by a person trained in hazardous waste management procedures selected by Hukill Chemical to present the most relevant program for that particular time. Continuing Training will include:
   1. Annual Review of Hazardous Waste Procedures and Development Update.
   2. Regular Safety and/or Training Review

III. Operations personnel will be given both initial 24-Hr HAZWOPER and annual 8-Hr review training.

a. Initial training for "hands-on" operations employees and the duties of that employee (Figure H-22)

b. In addition, employees will be trained in the Contingency Plan and in the handling of emergency spill clean-up.

c. Annually, the operations employees will be given a refresher seminar. This will be conducted by a person trained in hazardous waste management procedures. Refer to Figure H-26 for an example of the refresher training outline. Figure H-26 is an example only and the outline will vary from year to year based on regulatory and operational requirements.

IV. Laboratory personnel will be given both initial 24-Hr HAZWOPER and annual 8-Hr review training.

a. Initial training for "hands-on" laboratory employees and the duties of that employee (Figure H-22)

b. In addition, employees will be trained in the Contingency Plan and in the handling of emergency spill clean-up as it relates to the laboratory.

c. Annually, laboratory personnel will be given a refresher seminar. This will be conducted by a person trained in hazardous waste management procedures. Refer to Figure H-26 for an example of the refresher training outline. Figure H-26 is an example only and the outline will vary from year to year based on regulatory and operational requirements.

B. Record Keeping

Hukill maintains a master training file with employee roster. Also, for each employee at Hukill Chemical, a folder is placed in an employee training file. This folder contains:

a. A position description enumerating the job title, essential duties and responsibilities and education/experience requirements

b. A training record, "Hazardous Waste Employee Training Log", which describes employees interface with the handling of Hazardous Waste and the training sessions the employee has attended. (See Figure H-5) for a sample form.

c. Copies of certifications of training or training sign-in sheets.

d. Any other documents that Hukill Chemical will deem relevant to an employee and their training.

II. Record Retention

a. The records of each employee will be kept the term of their employment at Hukill plus at least three years after termination.

b. Records will be updated annually or when training occurs.

c. If the facility were to close, all records would be updated prior to that closure.

H 1(b) Training Director

In addition to overseeing the general training program and the initial training for each employee, the EHS Staff will chair the committee to select the content and presentation of the annual review and update sessions. For the annual 8-Hr refresher, Management may contract qualified trainers, consultants or colleges, to provide this training at an offsite location.

H-1(c) Relevance of Training to Job Position

Each person is given hazardous waste training related to his work function. Management personnel training covers operation of the facility, employee awareness concepts, and reporting requirements for hazardous waste activity. "Hands-On" personnel are concerned with the processing of products and hazardous waste. The management training is detailed above and the training cross reference for the "hands-on" employees is found in (Figure H-22). Also, refer to the example outline in Figure 26 for the "Hands-On" personnel training.

H-1(d) Emergency Response Training

Hukill Chemical's Contingency Plan, Evacuation Plan, Inspection Program, and Emergency Response Plan (see Section G) along with the other Training Programs incorporate familiarization with emergency procedures, equipment and systems within the facility. (These plans and inspection forms are included within this document.) Initial and refresher training covers these programs to ensure the employees have reviews appropriate to their particular job description, duties and locations. For example, the maintenance department would have more in-depth training in Preventative Maintenance. As described elsewhere in this document, all employees are trained in the communications and alarm systems which are plant-wide - used for day to day communications and emergency or life threatening situations. This is included during initial plant tours, as well as during hands-on training in assigned areas. Figure H-27 is an example of our shutdown of operations procedures, groundwater containment training, inspection and monitoring of the facility's emergency equipment training. The Emergency

Response Plan contains more detail regarding equipment-specific shut-down procedures.

A. Contingency Plan - Each new employee is instructed in the processes of the Hukill Chemical Corporation Contingency Plan.

B. Evacuation Plan - Every new Hukill employee is given specific instruction in evacuation procedures for their working areas.

C. Emergency Response Plan – covered with each new employee, including all office personnel as part of site safety training.

D. Inspection Program – Inspections of equipment, containers, tanks, dikes and permitted storage areas as required by OAC 3745-55-95 and 3745-66-74(B). Please refer to the inspection check lists found in Section F of this document. In addition, all Hukill workers are responsible for completing "Housekeeping Checklists" at the and of each shift. These checklists are specific to each regulated area and are an in-faciity program designed to reduce housekkeping violations and keep each work area clean. The checklists are available for OEPA inspection during the semi-annual inspection or at anytime. They are included with Section F for reference.

H-2 Implementation of Training Program

All current Hukill employees have received initial training. The schedule of that training, as an example, is (Figure 26).

H-3 Training Frequency

All employees who handle hazardous waste or supervise the handling of hazardous waste will receive initial 24-Hr and annual 8-Hr HAZWOPER training.

H-4 Training Records and Documents

H-4a Job Titles

As required by 3745-54-16(D)(1) Job titles for each position at the facility that is involved with hazardous waste management are kept in the operating record and in each individual's personnel file. Additionally, HCC includes the name of

every employee filling these positions as part of the facility operating record and is available for OEPA inspection.H-4b Job Descriptions

As required by 3745-54-16(D)(2), written job descriptions for each position listed on the roster are kept in the operating record (with the training records). These are amintained onsite and are available for OEPA inspection.

H-4c Training Description

See Figures H-22 and H-26.

H-4d Training Records

The Environmental, Health and Safety and Human Resources Staff will assure the continuance of the program that is outlined in this section. The files thus required will be kept in the facility operating record and will be maintained by Hukill's Environmental, Health and Safety Department.

These will be filed onsite for the duration of employment and will be kept for at least 3 years from termination of employment for each employee.

Figure H-22

Operations Employees

Initial Training Demonstrations

I. Operator

A. Using Safety Equipment
B. Handling Flammable Liquids
C. Handling Toxic Chemicals
D. Connecting Hoses and Valves
E. Loading and Unloading Farm Tanks
F. Operating Pumps
G. Operating Luwa
H. Operating Blow Down Boiler
I. Handling Corrosive Liquids
J. Manifesting for Hazardous Waste
K. Sampling Procedures for Containers and Bulk Receipts
L. Labeling and Marking Containers
M. Housekeeping Requirements

II. Maintenance Mechanic

A. Using Safety Equipment
B. Handling Flammable Liquids
C. Handling Toxic Chemicals
D. Connecting Hoses and Valves
E. Loading and Unloading Farm Tanks
F. Operating Pumps
G. Repairing Pumps, Valves, Tanks and Pipes
H. Maintenance on Pumps, Valves, Tanks and Pipes
I. Handling Corrosive Liquids

Figure H-22 (continued) - Operations Employees

III. Utility Worker

A. Using Safety Equipment
B. Handling Flammable Liquids
C. Handling Toxic Chemicals
D. Connecting Hoses and Valves
E. Loading and Unloading Farm Tanks
F. Operating Pumps
G. Loading and Unloading Bulk Trucks
H. Driving Lift Trucks
I. Pumping Out Drums
J. Cleaning and Repainting Drums
K. Handling Corrosive Liquids
L. Manifesting for Hazardous Waste
M. Sampling Procedures for Containers and Bulk Receipts
N. Labeling and Marking Containers
O. Housekeeping Requirements

IV. Truck Driver

A. Using Safety Equipment
B. Handling Flammable Liquids
C. Handling Toxic Chemicals
D. Connecting Hoses and Valves
E. Loading and Unloading Tanks
F. Loading and Unloading Tank Trucks
G. Manifesting For Hazardous Waste
H. Placarding Tanks and Vans
I. Labeling and Marking
J. Securing Drums In Van
K. Reporting Any Unusual Circumstances To Home Office Immediately
L. Handling Corrosive Liquids
M. D.O.T. Spill Response Requirements

Figure H-22 (continued)

V. **Laboratory Personnel**

A. Using Safety Equipment
B. Handling Flamable Liquids
C. Handing Toxic Chemicals
D. Hanling Corrosive Liquids
E. Manefesting for Hazardous Waste
F. Sampling Procedures for Containers and Bulk Reicepts
G. Labeling and Marking Containers
H. Laboratory Procedures including QA/QC requirements
I. Housekeeping Requirements

Hukill Annual Refresher Training

April 2004

Regulatory Overview

RCRA Regulations
OSHA Regulations
USDOT Regulations
Definition of a hazardous material
Training, Recordkeeping & Testing

General Awareness

Definitions (Hazardous Material, Hazardous Substance, Marine Pollutants)
Hazardous material Basic Shipping Description
Security Awareness Training
Changes to the DOT Regulations

RCRA Training

Definition of Hazardous Waste
Characteristic and Listed Wastes
Generator Requirements
Universal Wastes and Recycling
Empty Containers
Contingency Plan and Personnel Training

Function Specific Training

Security Plan Training
Segregation
Marking, Labeling
Container Specifications

Safety Training

Hazard Recognition, Evaluation and Control

Closing Remarks and Evaluation

Figure H-26

Section Title: **Control of Process and Equipment During Emergencies**

1.0 PURPOSE AND SCOPE

1.1 To ensure safe operation or shutdown of all process and equipment during emergencies, resulting from natural events, utility disruptions, and other external conditions. The priorities will be to protect:

1.1.1 The lives and safety of HCC employees and any emergency responders
1.1.2 The facility and equipment
1.1.3 The environment

2.0 DEFINITIONS

2.1 NA

3.0 SAFETY

3.1 All safety policies and practices set forth by HCC will be observed.

4.0 EQUIPMENT DESCRIPTION

4.1 NA

5.0 RESPONSIBILITIES

5.1 Primary: Department Personnel
5.2 Backup: Department Supervisors

6.0 PROCEDURE

6.1 The General Manager shall ensure that all processes have work instructions which cover their control during emergencies.
6.2 Department Supervisors shall ensure that all equipment is addressed concerning their protection during emergencies, as required.
6.3 All involved personnel will be trained in the emergency procedures at least once a year.
6.4 No individual will be allowed to operate a piece of equipment without having been trained in its emergency procedures.
6.5 Emergency procedures will be made available to first responders as required.
6.6 If an emergency is controllable the department(s) affected will follow their department procedures and report the emergency situation to their supervisor or Emergency Coordinator in a timely fashion.

6.7 Time and personal safety permitting, department personnel will follow their department procedures below in a quick, calm manner. If conditions are unsafe or an evacuation has been ordered, skip immediately to step 6.9 and contact supervisor.

6.8 Emergency Shutdown Procedures by Department:

6.8.1 Acid Department:

6.8.1.1 Shut off all valves on tanks in tank farm.
6.8.1.2 Shut off all pumps and close all valves on tankers being loaded unloaded.
6.8.1.3 Turn off lights, fans.
6.8.1.4 Close doors. DO NOT LOCK.
6.8.1.5 Skip to step 6.9 and contact supervisor.

6.8.2 Maintenance Department:

6.8.2.1 Shut off main natural gas line.
6.8.2.2 Turn off lights, fans.
6.8.2.3 Close doors. DO NOT LOCK.
6.8.2.4 Skip to step 6.9 and contact supervisor.

6.8.3 Solvent Processing Department:

6.8.3.1 L-050 Thin-Film Evaporator/Distillation Column (Old):

6.8.3.1.1 Close air activated valve to shut off steam.
6.8.3.1.2 Release jacket steam pressure by opening valves to blue box by East wall.
6.8.3.1.3 Release vacuum by turning vacuum control knob clockwise on control panel wide open. Gauge should read 15psi or greater.

6.8.3.1.3.1 If time allows: Proceed upstairs to vac pumps to close valve at bottom of cannister & shut off power to units.

6.8.3.1.4 Shut off rotor & pumps. Put all on/off switches to the off position (red buttons) located on control panel.
6.8.3.1.5 Shut off valves on feed lines.

6.8.3.2 L-411 Thin Film Evaporator/Distillation Colmn (New):

6.8.3.2.1 Close air activated valve to shut off steam.
6.8.3.2.2 Release jacket steam pressure by opening valves to blue box by East wall.
6.8.3.2.3 Release vacuum by turning vacuum control knob clockwise to wide open. Guage should read 15psi or greater.
6.8.3.2.4 Turn off rotor by pushing off button on control panel.
6.8.3.2.5 Turn pump switches (Three, one for each pump) on control panel to off.
6.8.3.2.6 Close feed line valve.

6.8.3.3 Skip to step 6.9 and contact supervisor.

6.8.4 Lab:

6.8.4.1 Close tank valve on Oxygen cylinder (green).
6.8.4.2 Turn off air conditioner/heater and hood blower
6.8.4.3 Turn off lights.
6.8.4.4 Close door. DO NOT LOCK.
6.8.4.5 Proceed to the Fractional Distillation Column/Stillpot and follow these steps:

6.8.4.5.1 Close the rotometer (PR-4) to stop product flow to tank or tanker
6.8.4.5.2 Close the steam actuator valve (ST-3) located on tower panel.
6.8.4.5.3 Close the steam pilot valve (ST-1).
6.8.4.5.4 Close the steam-blocking valve (ST-12) before the steam bundle.
6.8.4.5.5 Turn off decanter pump.

6.8.4.6 Skip to step 6.9 and contact supervisor.

6.8.5 Receiving Dock/Warehouse:

6.8.5.1 Turn off any forklifts in use, forks down.
6.8.5.2 Retrieve manifests for material on dock and latest receiving/inventory reports from receiving office.

6.8.5.3 Turn off any equipment, lights.
6.8.5.4 Close doors. DO NOT LOCK.
6.8.5.5 Skip to step 6.9 and contact supervisor.

6.8.6 Utility/Bulk Unloading Areas:

6.8.6.1 Shut off all pumps used to load/unload tankers or fill containers.
6.8.6.2 Close valves to all tanks being loaded to or from.
6.8.6.3 Skip to step 6.9 and contact supervisor.

6.8.7 Offices including Trailers:

6.8.7.1 Turn off any equipment, lights.
6.8.7.2 Secure at least one copy of Emergency Response Plan located in copy room, EH&S, General Manager or President's offices.
6.8.7.3 Close doors. DO NOT LOCK.

6.9 Clear the area following the evacuation plan as outlined in the Emerency Response Plan reporting to the front lawn for a headcount.

7.0 RECORDS

Record	Retention Period	Discard
NA		

8.0 ENVIRONMENTAL

8.1 NA

9.0 QUALITY STANDARDS

9.1 All quality standards set forth by HCC will be observed.

10.0 RELATED DOCUMENTS

10.1	Policy #15.15.1001	Handling, Storage, Packaging, Preservation and Delivery
10.2	Policy #23.11.1001	Employee Health & Safety
10.3	Policy #25.15.1001	Emergency Response Policy
10.4	Procedure #09.01.2003	Tower Shutdown Procedure

10.5 RCRA Part-B Permit, Contingency Plan, Section G
10.6 RCRA Part-B Permit, Training Plan, Section H
10.7 Emergency Response Plan, Evacuation Plan, Section 5

11.0 DOCUMENT HISTORY

Rev #	Date	Change	By
0	4/20/04	Initial Document	Mike Mraz
1	11/23/04	Modify Document Number, 1.1, Add 1.1.1-1.1.3 to replace original 6.3. Add 6.6-6.9, 10.3-10.7	Mike Rapp, Jeff McGlynn, Vince Valentino, Ed Potoma

Section I
Closure Plan

SECTION I

CLOSURE PLAN AND CLOSURE COST ESTIMATE

Introduction

This closure plan covers the "active" hazardous waste storage facility. It presents the methods for decontamination and/or disposal of tank systems and container and storage areas and applies to any future hazardous waste installations at the facility.

As new installations are submitted as modifications by Hukill Chemical Corporation (HCC) to the director for approval, the applicable sections of this closure plan will be modified and submitted to OEPA for approval.

NOTE: A RCRA Closure Plan and RCRA Corrective Measures Implementation Plan was submitted to the Ohio EPA by EarthTech to cover closure of the former hazardous waste tank farm and underground cistern.. This Plan was approved in its entirety by OEPA on June 12, 2001. Therefore the former hazardous waste tank farm, underground cistern and the solvent storage tank farm corrective actions and post closure care are not part of Section I closure plan and are addressed in other sections and documents.

The corrective actions and post closure care also required 30 years of Post-Closure groundwater monitoring to confirm the effectiveness of natural attenuation of groundwater. This program was previously covered in Section E of this application.

Facility Description

Hukill Chemical Corporation is a hazardous waste treatment and storage facility, located in a southeastern suburb of Cleveland, Ohio. The street address is:

Hukill Chemical Corporation
7013 Krick Road
Bedford, Ohio 44146

The mailing address is the same as the street address. This facility is primarily a chemical distribution center and solvent recovery facility. The solvent recovery facility accepts dirty industrial solvents from several different industries including automotive, polymer and chemical processing. Hukill uses two thin film evaporators (Luwas) and a fractionating distillation tower to reclaim solvent for return to the customer or sale to other customers.

A general facility drawing is provided as Exhibit I- 1 which shows the locations of the items discussed below. The existing hazardous waste units requiring a permit are as follows: *Note that all existing diked storage tanks are constructed of carbon steel or stainless steel. The dike is designed to contain leaks, spills or*

precipitation. The tanks are located above ground and specifics relating to tanks dimensions are provided in table I-1.

1. The East Pad 7-tank dike contains seven 14,000gallon vertical storage tanks for spent solvent and off-specification organic chemical wastes. This dike is located east of and adjacent to the processed solvents storage tank dike. Tanks designated as T-57, T-58, T-59, T-60, T-61 and T-62 were purchased "used" and installed in 1969. These tanks were relocated in early 1989 from the gravel-on-clay base dike to the new concrete hazardous waste storage tank dike constructed on the East side. Each tank is on a "housekeeping pedestal" which is on the concrete containment slab. The dike slab is constructed of 4,000 psi. concrete with two layers of steel mesh per the design of the structural engineering consultant.

The dike was designed to contain 13 foot diameter tanks, with the NFPA minimum inter tank distance of one sixth the total of the adjacent tank diameters. The space between these tanks is greater than the NFPA calculated distance of (10.5' + 10.5')/6 or 3.5 feet.

These tanks have a diameter of 10.5 ft. and a height of 24 ft. They are flat bottomed with one 2" outlet at the bottom for the purpose of filling and emptying the tanks. The tanks are cylindrical with a riveted plate construction. The original thickness of the plate used in construction was 3/8". The material of construction is carbon steel. The grade of carbon steel is unknown but thought to be a standard A-285B. The maximum pressure exerted against the bottom of the tank generally will not exceed:

(Maximum spec. gravity of 1.33)

$$(24 \text{ ft. head} \times 1.33 \text{ sp.gr.}) \times \frac{12 \text{ in./ft.} \times 1 \text{ lb./sq. in.}}{27.7 \text{ in. } H_2O} = 13.8 \text{ psi}$$

The conservative minimum shell thickness is 0.0954" that would be sufficient to safely store the material in these tanks. (Note: The specific gravity of each waste stored in these tanks is checked and documented on the Operating Record). These tanks will be taken out of service when this minimum thickness is detected.

These tanks are operated at atmospheric pressure and are equipped with conservation vents. The chances of rupturing due to over pressuring or collapsing during emptying are virtually nil. The tanks are not equipped with pressure gauges. Wastes stored in these tanks are at ambient temperature.

These tanks are protected from over-filling by using a manual shut-off system. A radar level sensor is used to show tank level. The operator watches the level indicator while filling the tank. As the indicator shows the tank is near full, the operator will shut off his transfer pump and close the inlet valve to the tank. The

volume of waste in the tanks is determined by gals. /inch reading taken off the signal return level. Each tank is equipped with a high level probe connected to a high level alarm as required to prevent overfilling the tank.

All piping from the tanks is standard 2" carbon steel, Schedule 40 threaded pipe. Pipe to pipe connections are either threaded couplings or unions. Pipefitting are threaded, Schedule 40, tees, elbows, reducers, etc. All valves are threaded body gate or ball valves with working pressures of at least 140 psig. Hoses are utilized to provide maximum utilization of a small number of portable pumps to transfer materials to and from a large number of tanks. All hoses are either metal reinforced elastomer type or all-metal (steel) flexible hoses. The pressure rating on these hoses is at least 100 psig. Hose fittings are quick-release OPW type fittings, again, good to at least 100 psig. All transfer lines are routed inside the containment area.

2. The Feed/Bottoms storage tank dike contains two 6,000 gallon, cone bottom, distillation feed tanks and one 16,000 gallon, cone bottom, distillation bottoms storage tank. The materials stored in these tanks are also organic chemical hazardous wastes. This dike system is a combination of the Feed Tank Dike and Bottoms Tank Dike. There is a wall with an overflow notch separating the two dikes. If liquid comes with in a foot of filling either dike section it will over flow to the other dike section. A fourth tank is in this dike it is used for processed solvents only. The two 6000 gallon feed tanks were installed when the plant was built in 1968. The bottoms tank was installed in 1979. Both sections of the dike have steel reinforced concrete walls and base. The south wall of both dikes and the east wall of the system are 14 inches thick. The remaining walls are 12 inches thick. Each section is sloped toward a 2 inch ball valve cast into the south concrete wall of the section and is fitted with a quick disconnect. The dike walls and slab are coated with an impervious material.

3. The East Warehouse is used to store containerized spent solvent and organic chemical hazardous wastes in drums and portable tanks. The total facility permitted capacity for storage of containerized hazardous wastes is currently 55,000 gallons, equivalent to 1,000 fifty-five gallon drums.

Physically, the East Warehouse measures 75' north to south and 121' 4" west to East. The first 80' of the north wall, running west to East, is concrete block and adjoins the Process Building. All other walls and the roof are corrugated metal. Structural supports are steel I-beams.

The floor itself is 6" thick concrete reinforced with 10# x 10# wire mesh. The floor is anti static, having a loading of 2,000 lb. per square inch. The containment area has been constructed of butt welded 3/16" thick hot rolled carbon steel, Grade A-36. The steel curbing was made by bending, "braking", and the steel plate to form the curb. The concrete floor was mechanically

cleaned and then water blasted to remove any residual material prior to installation of the steel plate. (Precipitation is not a concern).

Equipment is held in place on the steel floor by clips which are welded to the steel floor so that the steel floor is not pierced.

The steel containment curbing extends 4.5 inches above the floor. A steel plate cap is attached to the concrete curbing, extends horizontally inside the steel containment area and then turns down toward the floor. This cap is caulked at the concrete juncture. The purpose of this cap is to prevent any splashes from getting between the edge of the steel containment curb and the concrete curbing.

S.M. Haw Associates has reviewed the structural design of the east warehouse for container storage and fork truck traffic and found it to be satisfactory. A statement from S.M. Haw Associates is found in the site permit application section as Exhibit D-11.

To avoid static electricity, the steel plate containment is grounded with grounding rods and with connectors to the building columns, which have been grounded.

4. The No-Free-Liquids outside storage area is east of the East Warehouse on the East Pad Containment Area. This area is used for storing drums or portable containers of organic chemical hazardous wastes which have no free liquids. This area is rarely used but may be necessary for efficient management of containerized hazardous wastes.

.

All drums stored in this area are elevated on 4 1/2" thick pallets. All precipitation is drained to an underground tank, shown as the Containment System for Outfall 001, via a pad drain. The base of the pad is reinforced concrete approximately 8 inches thick. The area designated for storage is 13' x 52'= 676 sq. ft. We can store a maximum of 360 containers which contain no free liquids in this storage area.

It is felt that the concrete used for the base material in all three locations where containerized hazardous wastes are stored is a completely suitable material. Based on our policy of excluding very acidic and basic materials, plus our policy to neutralize, as soon as possible, wastes that arrive that are only slightly acidic or basic, we feel the chances of a spilled or leaked hazardous waste causing any significant damage to the concrete are extremely low.

5. The Hazardous waste Fuels Dike (F-1) is located on the East Side of the East Warehouse. Three tanks T-14, T-15, and T-16 are also located in a concrete dike area. The tank system assessments for Tanks 14, 15 and 16 and the existing dike, F-1, found in the section D of this application.

There are four tanks in this dike, but only these three require permitting. Tank 13 is a 90-day generator tank. Tank 13 will be closed in the same manner as tanks 14,15 and 16. As described in Exhibit D-6, the dike has concrete walls and slab. The interior slab and walls of the dike are caulked and coated with an impermeable coating. The Containment Volume Calculations for this dike are found in Appendix B of Exhibit D-2, and summarized in Table D-2, in the appendix of this section, under the heading "F-1".

Ancillary equipment including piping outside of the dikes will still be aboveground and over containment areas as required by OAC 3745-55-93 (F). Magnetic sealless pumps have not been satisfactory for handling HCC's type of hazardous waste in the past. HCC uses portable gear pumps contained inside drip pans and which are inspected on a daily basis. These pumps are used only on concrete containment areas. As magnetic pump technology improves, HCC will continue to test their application to handling their hazardous wastes.

The quick coupled connectors used to provide the transfer flexibility for managing and processing hazardous wastes are non-sparking and have performed well through many years of service. The operators are trained to inspect the "O" ring gaskets and the coupling device each time a connection is made.

A "drip pan" has been designed to contain any dripping that may occur when disconnecting a line from any hazardous waste tank connection across a dike wall. Any accumulation in the pan is pumped out through a discharge valve on the bottom. The drip pan is also designed to overflow back into the containment dike in case a valve or connection should fail.

In addition to the daily inspections, HCC as required by Federal law, 40 CFR Part 264, Subpart BB, tests the valves and connections for all hazardous waste lines for volatile organic emissions and records the results. The prescribed corrective action and record keeping provides further assurance of spill prevention.

6. The Drum Processing Hochmeyer (Disperser tank) and Auger treatment systems. These processes are used to remove liquid or semi-solid hazardous waste material from drums and blend the material into a HW Fuels Blend.

The 1,000 gallon tank provides residence time for batch or continuous dispersion of H.W. Fuels Blends. This tank was designed and modified in 1993 for this purpose. Refer to Exhibit D-8, the tank integrity assessment report, for the design details of this tank.

This tank is equipped to be fed materials in liquid or solid form and provide residence time for the desired dispersion of the solids in the liquid.

An Ultrasonic thickness inspection has been done on this tank. Structural references and integrity assessment of this tank can be found in section D of this permit. The tank was substantially modified and placed into service in 1993.

This tank will be taken out of service when a minimum shell thickness of 0.0342 inches is detected.

This tank is located indoors. The containment is the same 3/16inch carbon steel area as for the East Warehouse (item # 3) and will be inspected, along with the tank, on a daily basis. Records of these inspections will be retained with the operating records.

The area around the Disperser Tank is a restricted area. The area has an electrical designation of Class I, Group D, and Division 1. Rules and procedures pertaining to this classification apply here. All tanks are at least 5 feet from the nearest side of any public way or from the nearest important building on the same property, as required by OAC 3745-55-98 (40 CFR 264.198)

The auger systems tank (750 gallons) and associated equipment is located within the permitted container storage area containment in the east warehouse. Please refer to section D of this permit.

The auger system tank provides containment and dispersion for the contents of hazardous waste drums emptied by the auger. The auger is mounted above the auger system tank and dislodges solids and liquids from drums. A hydraulic, operator-controlled clamping device is used to position the drum in place for the auger and to dump the drum's contents into the auger system tank. The RCRA empty drums are then lowered to the floor and handled as appropriate. The empty drums are inspected as they are removed from the empty drum elevator. In case a drum is not RCRA empty, it will be processed through the auger system again, cleaned out by hand, or topped off with solids and/or absorbents and prepared for shipment off-site as a hazardous waste container.

The auger system tank is equipped with a "pulper" type agitator mounted inside the bottom of the tank. A perforated metal plate is directly below the agitator and covers the tank discharge area. The "pulper" agitator breaks up the solids

suspended in liquid. When the solids are small enough to pass through the perforated plate openings, the slurried material is pumped to either recycle back to the auger system tank to aid in dispersion of other solids or pumped to the chemfuel storage tanks. The piping system for both recycle and chemfuel product will be 150 psig rated steel piping and 150 psig rated valves.

During the treatment process the material may be processed through the Hochmyer, Auger or both. When treatment is completed the material is pumped through the strainer placed into the permitted storage tanks or generator storage tank. The material is then sampled prior to shipment to the off-site receiving facility.

7. Process/feed tanks 8-3-F, 9-3-F, 10-3-F and 11-3-F are 2,900gallon agitated, feed tanks. They are located in the processing building. They are located within a spill containment dike which is 412.5 cubic feet (3,086 gallons). More description about these tanks can be found in Section – D and Exhibit D-7.

Engineering calculations relating to the containment system and tank construction are located in Section –D of the site Permit.

8. Distillation Processing Area (LUWA Room). This area is curbed and concrete construction. In process material (material stored in drums) are stored in this area. The less than 90-day storage is located in the room and will be closed at the same time as the process area.

9. 24 Hour Staging Area, is located in the Dock Area. Containerized waste are received by trucks in the Dock Area. In accordance with OAC 3745-54-71(A) (part 264.71 (a)), if all drums are properly labeled and found to be in sound physical condition, HCC will accept the waste for storage by signing the manifest. Sampling of the drum occurs in the Dock Area (24 hour staging area) followed by analysis, storage, and subsequent processing. Drums may remain in the 24-hr Staging Area on the Container Receiving Dock awaiting sample analysis results. Upon completion of waste analysis containers are then transferred into storage areas on 42" x 48" wooden pallets. The storage location is recorded in the site operating record. Forklift trucks transport containers. The dock area is partially curbed at the back of the dock and made of concrete.

If any releases occur from the tanks or other units they would be captured in the containment system. Any releases will be documented in the facility operating record which will include what actions were taken once the release was reported. If no releases occurred this would be demonstrated through review of the inspection records and facility operating record.

The contact and responsible party for the hazardous waste management activities at Hukill Chemical Corporation is Robert L. Hukill, President. Telephone number: (440) 232-9400.

Table 1, in the appendix of this section, lists the hazardous waste solvents stored at the facility. The container storage areas and the storage tanks for the H.W. solvents processing side of the facility are considered to have had all of the hazardous wastes, listed under the heading of "H.W. Solvents," stored in them at one time or another. All of the wastes at the facility may contain materials that add the characteristic of toxicity.

Table 2, in the appendix of this section, lists the container storage areas and the maximum capacity for the areas. Table 2 also lists the existing hazardous waste storage tanks and their capacities.

Geologic and Hydrogeologic Conditions

Investigations conducted in 1986 included test borings and monitoring well installations to define soil, subsoil, and shallow geologic and groundwater conditions at the site. At that time 63 soil borings and six monitoring wells were installed. This information was reported in the Site Investigation Report generated by Eder and Associates in 1987. Most of the site is underlain by fill material ranging in thickness from one foot to over twenty five feet and consists of silty-sandy clay loam except in the "Chem-Pack" and Northwest fill areas where other types of fill are present. Underlying fill material is glacial till deposited during the Illinoian stage of glacial advancement. It is a silty clay till which varies in thickness at the site. In some areas the fill material overlies the shale bedrock (Meadville Shale).

A fractured and weathered zone characterizes the upper 25 ft. of the shale. Numerous fractures are present which allow the circulation of shallow ground water. Beneath this zone, the shale is more consolidated, less permeable, and is aquiclude (not water bearing unit).

A small gully borders the northern edge of the site were the surface topography drops sharply into a small tributary of Deerlick Run, Tinkers Creek, Cuyahoga River and ultimately Lake Erie. Unconsolidated glacial deposits pinch out in this gully, which contains alluvial deposits consisting of interbeded silty clays, sandy clays and laminated silts with interbeded layers of organic clays and silts. These sediments lie directly on the shale bedrock which outcrops along the creek.

To the northeast edge of the site has a drainage tile to manage storm water from off site and some onsite storm water, which does not come in contact with the site waste management. The tile was installed in 1990 to allow the filling of a drainage ditch. The work was done with an approve Army Corps of Engineers

National Permit. The soil for the back filling was from off-site. The soil was tested and monitored in-place density testing on compacted fill.

The groundwater at the site has been confirmed in the weathered shale zone, which is overlain by relatively impermeable silty clay fill and glacial till deposits and underlain by unwathered shale. Water levels in wells in weathered shale stabilized an average of 10 ft. higher than the saturated zone tapped by the wells. The saturated weathered shale zone is underlain by gray shale, which forms the lower confining layer.

No groundwater was detected in the shale below the saturated fractured and weathered zone. The site investigation results indicated that the groundwater found in the weathered shale under the site is confined to a narrow zone near the till/shale interface. The flow pattern in this zone appears to be lateral into the creek, which forms the northern boundary of the property. Groundwater flow at the site is predominately to the north-northeast toward the alluvial deposits at the creek.

The groundwater flow at the site may be described as occurring between highly fractured zones and zones where there are less fracturing and open pore spaces. The number of cracks and fractures present controls the permeability or hydraulic conductivity of this groundwater system. The groundwater flows in these cracks and fractures downgradiant toward the creek.

HCC also has other non-RCRA permits identified in the Part A Application of this document.

I-1a Closure Performance Standard

This closure plan is consistent with OAC 3745-55-11, which is the closure performance standard. HCC will close the facility in a manner that will minimize the need for further maintenance and minimize or eliminate the threat to human health and the environment. HCC will also comply with OAC 3745-55-12 as outlined in the Ohio EPA "Closure Plan Review Guidance" published March, 1999.

Closure procedures for a storage, treatment and processing facility will be followed. These procedures consist of removal of all waste in storage to another treatment, storage or disposal facility. Processing equipment (i.e. drum auger and auger mix tank and Hockmeyer filtration systems) will be disassembled and decontaminated, as necessary. The strainer/manifold will also be disassembled and decontaminated at closure of the facility. Closure and all closure activities will be overseen by a registered professional engineer and will be documented in a Closure Certification report per OAC 3745-55-11 and 12.

Removal of all waste materials from tanks and container storage will also eliminate any threat to human health and the environment from the permitted areas of the closed facility.

I-1b Partial Closure

Partial closure of the container storage areas may be done as operating facility requirements change. The procedure listed under I-1d (1), "Closure of Container Storage and Handling Units." would be followed. Partial closure would also apply to individual tanks as they may be determined to be unfit for use. We would follow the procedure outlined under the heading below, "I-1d(2) Closure of Tanks."

I-1c Maximum Waste Inventory to be removed

The current permitted H.W. storage volume is:

Container Storage.....55,000 Gallons

Tanks..... 185,000 Gallons

An estimated seventy- percent of the 171,100 gallons of spent solvents in tanks and fifty percent of the spent solvents in containers are considered recoverable.

An estimate of the maximum quantity of hazardous waste generated that would be required to be shipped off-site has been made. These are the wastes which could not be sent to an approved fuels burner for energy recovery after recovery of solvents and generation of HW fuels blends, as done in HCC's normal operations. This estimate contains contaminated materials generated during the closure activities; scale, dirt, spent blasting sand, contaminated protective clothing and rinseate water.

All of this material would have the waste codes listed in Table 1 of this section. Any Corrosive Hazardous Wastes from Container Storage may have the waste codes listed in Table 3A, found in the Appendix to this section.

Following is the estimate of the maximum volume to be treated or disposed of at an EPA approved TSDF:

PERMITTED H.W. MANAGEMENT UNITS:

H.W. Solvents, Wastes described in Table 1:

Contaminated soil and debris, plastic, plant cleanup waste, etc.
drums ..... 40 dms.
H. W. process water, bulk .....20,000 gal.
Closure rinseate water, bulk ..... 6,000 gal.

I-1d (1) Closure of Container Storage and Handling Units

PERMITTED H.W. SOLVENT UNITS

General information regarding these units is found in the Facility description portion of this section. These units include the Processing area, container storage area, HW fuels processing area, no free liquids storage area, and 24-hour staging area. More detailed engineering information is found in Section D of the Part B permit and will be provided as an addendum to this section at the time when the closure plan is implemented.

No large spills to the environment have occurred. Smaller spills have occurred overtime and were cleaned up as per house keeping protocol.

The container section of the storage facility will be closed by pumping containerized wastes to the recovery process or by removing the entire container to another permitted treatment, storage or disposal facility.

Containers will be decontaminated by the following methods: pumping out the material, dumping out material that will not pump out, and cutting out the head and dumping the solids out. Empty drums will have less than 1" of waste in them. When empty the containers will be Rinsed and sent to an off-site drum reconditioner.

The secondary containment floor system will be decontaminated using established decontamination procedures. These decontamination procedures include absorbing the spilled liquid with an absorbent media, shoveling the absorbent media into a 55 gallon drum and then rinsing the area with a suitable solvent, absorbing the rinseate in an absorbent media and shoveling that media into a 55 gallon drum for disposal. The steel floor will be washed and deconed in the same manner as the tanks. The floor will be washed and rinsed three times depending on the disposition of the steel the rinseate may be sent out for analysis. It is assumed that the floor will be removed during closure and sent out as scrap steel for recycling or it will be disposed of as solid waste. If it is used on another manner the rinseate will be analyzed and compared to MCL levels for drinking water, a risked based standard or other health based standard. The concrete floor under the steel floor will be washed and rinsed in the same manner as the steel floor or 0.6 centimeters of the surface layer will be removed. The floor will most likely be used for industrial purposes or it will be removed to a demolition debris landfill. If the area will be used for other purposes will be evaluated and a rinseate sample will be sent out for analysis. The rinseate will be analyzed and compared to MCL levels for drinking water, a risked based standard or other health based standard. The rinseate will be collected by a vacuum in both decon activities. A representative for the PE may be present during decontamination activities and the PE will be present for significant

activities of the closure and the collection of the final samples. Samples will be collected from any cracks in the concrete and areas specified later in this document. The steel flooring will be managed in the same manner as permitted tanks. If the final rinseate is determined to be "clean" then the steel will be manage as scrap steel. If some or all of the steel flooring can not be cleaned it will be managed as hazardous waste.

The Distillation Process Area (LUWA room) will be washed and 0.6 centimeters of the concrete surface will be removed. The room floor is concrete. This area includes a less than 90-day storage area, which will be closed at the time the room, is closed. The room also includes the secondary containment for tanks 8 through 11. The secondary containment dike will be washed and rinsed. If any cracks are noted during the closure activities soil samples will be collected from those areas. A representative for the PE may be present during decontamination activities and the PE will be present for significant activities of the closure and the collection of the final samples. The floor will most likely be used for industrial purposes or it will be removed to a demolition debris landfill. If the area will be used for other purposes will be evaluated and a rinseate sample will be sent out for analysis.

In areas like the no free liquids storage area which do not have curbing on all sides curbing will be constructed to collect the wash water and rinse water. This curbing will be constructed of 2x4 wood covered with plastic or like materials. The curbing will be fastened to the surface of the storage area. Plastic will also be placed around the areas during cleaning and final rinse to ensure all decontamination materials are collected. The concrete storage area will be washed and rinsed in the same manner as the storage area discussed earlier or 0.6 centimeters of the surface layer will be removed. The concrete area will most likely be used for industrial purposes or it will be removed to a demolition debris landfill. If the area will be used for other purposes will be evaluated and a rinseate sample will be sent out for analysis. The rinseate will be analyzed and compared to MCL levels for drinking water, a risked based standard or other health based standard.

The 24-hour staging area/ dock area will have 0.6 centimeters of the surface concrete removed. The area is partially curbed at the back of the dock and 2x4 wood covered with plastic or like materials will be used for curbing in areas where curbing does not exist. Plastic will be place around the area to contain the decontamination activities. The concrete area will most likely be used for industrial purposes or it will be removed to a demolition debris landfill. If the area will be used for other purposes will be evaluated and a rinseate sample will be sent out for analysis. The rinseate will be analyzed and compared to MCL levels for drinking water, a risked based standard or other health based standard. A representative for the PE may be present during decontamination activities and the PE will be present for significant activities of the closure and the collection of the final samples.

The rinseate will be collected by a vacuum in both decon activities. A representative for the PE may be present during decontamination activities and the PE will be present for significant activities of the closure and the collection of the final samples. Samples will be collected from any cracks in the concrete and areas specified later in this document. The rinseate will be collected by a vacuum or some other form of suction pump and place in storage containers for proper disposition. If the water meets the facility discharge limits it will be discharged to the local POTW. If it does not meet the limits it will be treated on site or sent to an off site treatment facility depending on its regulatory status. Any removed material will be properly characterized for disposition.

Samples will be sealed by the person taking the sample. A label will be attached to each sample with the identification of the source, time, date, method of sampling and the name of the person taking the sample.

The outside laboratory chain-of-custody protocol will be followed which requires each person handling the samples to sign off and date the form when the sample enters their custody. The chain-of-custody form will be included with the resulting analytical data which will be part of the Closure Certification report submitted to OEPA (OAC 3745-55-11 & 12. The samples will be analyzed by an off-site laboratory which will be required by contract to comply with approved EPA analytical methods and have a QA/QC program in place.

Rinseate samples will be analyzed for the parameters and using the test methods detailed in Table 3, found in the Appendix of this section.

As detailed previously, an independent, qualified, professional engineer, registered in the state of Ohio, will be present to observe the rinsing and rinseate sampling for each area.

Containment linings, contaminated soils, and decontamination washes will be characterized prior to either recovery or transport to another treatment, storage or disposal facility.

Core samples will be taken inside the Drum Processing Building and Container Storage area. A core sample will be taken near each sump. A maximum of twelve core samples will be taken in this Drum Processing/Container Storage warehouse. *These locations will be submitted to OEPA for approval in accordance with closure plan requirements, prior to any activity.* Core samples will be obtained near any large cracks or any gaps in the base concrete floor slabs after the steel floor has been removed. If the decision is made not to remove the steel floor, alternate investigations outside along the warehouse walls will be proposed for OEPA approval (as detailed previously). These samples will extend two feet below the surface or concrete slab. Total analysis will be run on discrete of these samples for each area. The professional engineer will evaluate

the analytical results compared to background conditions for naturally occurring compounds and determine if additional samples should be taken.

The sampling handling protocol described above will be followed for these core samples.

If the clean closure standards cannot be met, the HCC will prepare a sampling plan and, based on the results of the sampling plan, a remediation plan. The timing for submittal of these plans, if required, is shown in Figure I-1, "Schedule for Closure", found in the Appendix to this section.

I-1d (2) Closure of Tanks

H.W. SOLVENT STORAGE TANK SYSTEMS

General information regarding these units is found in the Facility description portion of this section more detailed engineering information is found in Section D of the Part B permit and will be provided as an addendum to this section at the time when the closure plan is implemented.

No large spills to the environment have occurred. Smaller spills have occurred overtime and were cleaned up as per house keeping protocol. On January 28, 2004 the contingency plan was implemented when a flash fire in the auger tank activated the site fire suppression system. The fire was put out instantly, no damage to the equipment, storage area or release to the environment. All required notifications and documentation was completed.

At closure, all wastes will be discharged from permitted H.W. storage tanks to either the recovery process or to tanker trailers for transport to another treatment, storage or disposal facility. If hazardous wastes are present within the tank dike structure, these will be removed. The removal will require pumping of spilled liquid into drums or tank trailer and final washing of the dike floor and walls. Once the tank decontamination is completed the secondary containment will be decontaminated. Absorbent pads and plastic will be placed around the containment. The containment will be washed and rinsed three times. The disposition of the tanks will most likely be that they are being taken out of service, cut and removed as scrap steel for recycle. The tanks may change regulatory status from a permitted tank to a 90-day generator tank or they may be used for storage of product solvents. In these three potential events the tanks would be cleaned with out a final rinseate sample collected. If the disposition would be for other use then a final rinseate sample would be collected and sent off site for analysis. The rinseate will be analyzed and compared to MCL levels for drinking water, a risked based standard or other health based standard. The rinseate will be collected by a vacuum in both decon activities. A representative for the PE may be present during decontamination activities and the PE will be

present for significant activities of the closure and the collection of the final samples. Wash and rinse waters will be collected and managed appropriately. Soil samples will be collected near any cracks in the containment.

All permitted H.W. storage tanks will be decontaminated at closure. The tanks will be decontaminated in place that is within the secondary containment. The secondary containment will be the decontamination pad. The decontamination procedures will be accomplished by rinsing the inside of the tank with a suitable solvent and pumping the solvent to onsite distillation/fractionation equipment. Solids generated from distillation/fractionation will be shipped offsite as HW Fuels Blend for incineration. Recovered solvent would be returned to the generator as clean product. The effectiveness of decontamination will be determined by visually inspecting the clarity of the decontamination liquid, i.e., acetone. When the liquid appears clean, the tank will be steamed out.

A steam hose will then be attached to the discharge line of the tank. The tank will be steamed out for at least an hour to remove any residual cleaning solvents. The condensate will then be either discharged to the sanitary sewer, if it meets acceptable limits for the Northeast Ohio Regional Sewer District listed in Table 4, found in the appendix to this section, or sent to an approved disposal facility.

In some cases, there may be a significant amount of scale inside the tank to trap small amounts of hazardous waste spent solvents. In these cases, the inside of the tank will either be scraped or waterblasted as approved by OEPA for residual waste removal. Waterblasting is a more thorough cleaning method and reduces the risk of airborne VOC or particulate emissions. Waterblasting also eliminates static charge –vs- sandblasting. Proper precautions will be made to assure that personnel are protected. They will wear protective clothing that can be disposed of and alternate confined space entry procedures will be followed, if applicable, in accordance with the OSHA 29 CFR 1910.146 standard.

A decontamination area will be established within each tank dike for PPE and equipment cleaning and disposal. After the scraping and/or waterblasting, hazardous residues will be placed into drums and properly labeled as hazardous waste. If enough water is generated, it may be fractionated. The protective clothing will be removed and placed in a drum marked hazardous waste. These drums will then be properly disposed of.

There should be no minimal air emissions during the Closure activities. The steam applied to the tank should condense inside the tank, on the tank walls, and the condensate will be collected as described above.

The independent qualified professional engineer, registered in the State of Ohio, will observe a water rinsing of the interior surfaces of the tanks and contaminated storage surfaces and sampling of the final rinse water. The rinse water will be managed as hazardous waste and either sent to the sanitary sewer,

if it meets the limits listed in Table 4 of the appendix to this section, or sent to an approved disposal facility. As much water as necessary will be used to rinse the inside of each tank.

Samples will be sealed by the person taking the sample. A label will be attached to each sample with the identification of the source, time, date, method of sampling and the name of the person taking the sample.

The outside laboratory chain-of-custody protocol will be followed which requires each person handling the samples to sign off and date the form when the sample enters their custody. The chain-of-custody form will be included with the resulting analytical data which will be part of the Closure Certification report submitted to OEPA.

Rinseate samples will be analyzed for the parameters listed in Table 3 using the test methods and "clean" standards detailed in Table 3, found in the Appendix of this section.

Hukill will have the rinseate tested by an outside laboratory for those parameters which appear in Table 3, of the appendix in this section. The test methods and "clean" standards listed in Table 3 will apply to these rinseate analyses.

The flame arrestor, vent relief valve, level probes and any valves and piping attached to the tank will be steamed out with the condensate managed appropriately based on analytical results of the rinsate . If the piping valves, relief vents, or probes are still contaminated, they will be labeled as Hazardous Waste and sent to an approved thermal destruction facility.

All hazardous waste and decontamination washes generated at closure will either be:

1. run through the recovery process and the clean solvent sold, the residue disposed at a proper facility, or;

2. the hazardous wastes and decontamination washes will be transported to another hazardous waste facility capable of handling this material.

All solid waste residues removed from tanks and associated structure and contaminated soils will be characterized prior to transport to an appropriate hazardous waste facility, i.e. incinerator or an approved thermal destruction facility.

Any soils contaminated during the closure will be transferred to properly labeled containers, analyzed for contaminants and sent to an approved thermal destruction facility. At this time it is assumed that the soil contamination associated with these units is minimal.

All hazardous wastes shipped off-site will be properly manifested and a land disposal restriction notification will be sent with the shipment. The transporter will be a licensed hazardous waste transporter.

The tanks will be either scrapped, sold or reused for product storage after the Ohio EPA has reviewed the final closure activity documents and approved the closure.

Three core samples will be taken inside each hazardous waste tankdike. The samples will be taken at equal distances within the dike walls along the longest centerline of the dike. One core sample will be taken on each side of the dike unless that side abuts another H.W. management unit which has already been sampled. A core sample will be taken near the sump of each dike. A minimum of five core samples will be taken for each dike area. Core samples will also be taken near any large cracks or any gaps in the containment area slabs. These core samples will extend two feet below the surface or concrete slab. Total analysis will be run on discrete of the samples for each dike area and analyzed for the toxic constituents listed in Table 3A, found in the Appendix to this section. A professional engineer will evaluate the analytical results compared to background conditions for naturally occurring compounds and determine if additional samples should be taken. The samples will be labeled with the identification of the source, time, date, method of sampling, and person collecting the sample. The off-site laboratory chain of custody protocol will be followed. The samples will be analyzed by an off-site laboratory which will be required by contract to comply with approved EPA analytical methods and have a QA/QC program in place.

The sample handling protocol described above will be followed for the core samples.

If the clean closure standards cannot be met, HCC will prepare a sampling plan and, based on the results of the sampling plan, a remediation plan. The timing for submittal of these plans, if required, is shown in Figure I-1, "Schedule for Closure", found in the Appendix to this section.

I-1d (3) Closure of H.W. Handling Equipment

The decontamination procedure for H.W. processing equipment and HCC owned transport trailers used in the shipment of hazardous waste is the same as outlined above for tanks in I-1d (2).

I-1d (4) Closure of Contaminated Site Areas

As discussed under "I-1a Closure Performance Standard", those areas determined to be contaminated through sampling, will be resampled in accordance with a Supplemental Sampling Plan which will be prepared and submitted for OEPA

approval. Based upon the results of the sampling plan an Amended Closure Plan will be submitted depending upon the nature of the waste which contaminated the area(s) in question.

I-1e Schedule for Closure

The life expectancy of this solvent recovery facility cannot be determined at this time. The facility owner and operator expect to remain in business for an indefinite period. However, for purposes of compliance with the closure requirement, Hukill Chemical proposes the following schedule:

- Hukill Chemical Corporation will notify the Director 45 days prior to initiating closure activities.
- The Closure Plan will involve activities, which will be completed as indicated in Figure I-1, "Schedule for Closure". All costs will be updated annually.
- Closure will be accomplished in accordance with the time line in Figure I-1.
- The final closure will be supervised and certified by an independent, qualified, professional engineer, registered in the State of Ohio and the owner/operator.
- A final Closure Certification report will be prepared and submitted to OEPA within 90 days of completing all closure activities on site.

I-1f (1) Description of Security System

The working area of the HCC site is completely surrounded by a six-foot high chain link fence topped by barbed wire. Gates are locked at all times at the site. .

Visitors and contractors are required to sign a logbook in the front lobby and must obtain a "Visitor" or "Contractor" badges. Badges must be returned prior to leaving the site.

Signs, which are visible from at least 25 feet, are posted at the gates and around the fenced area which read "Danger - Unauthorized Personnel Keep Out".

During closure, active areas for closure operations will be cordoned off with warning signs to keep personnel not involved with closure activities out of those areas.

I-1f (2) Personnel Safety and Fire Prevention

All personnel involved in the closure will meet the requirement for health and safety training for all hazardous waste site promulgated by OSHA on March 6, 1989 29 CFR 1910, 54 FR 9294, "Hazardous Waste Operations and Emergency Response. Final Rule." Particular attention will be given to the training of outside contractors involved in the closure activities. The confined space entry procedures and the procedures for lockout and tag-out of potential sources of energy release will be reviewed by all personnel involved in the closure activities. HCC does have site emergency procedures and site safety and health plan.

An MSA Passport, or equivalent, O2/LEL/CO monitor will be provided for activities that are non-standard to the daily activities of the current operations. Each closure activity will be reviewed to determine the level of personnel protection required. As discussed in the closure details in section I-1D, above, disposable clothing will be used and disposed of at a decontamination station as hazardous waste.

All safety equipment checks and contingency plan check lists will be followed during the closure period.

The fire prevention equipment inspections and tests will be maintained throughout the closure period. The fire department will be advised that the facility is going through closure activities and a schedule of closure activities will be provided for them.I-1f (3) Other Permits

HCC will not require additional permits for successful implementation of the closure plan.

HCC does have air permits maintained by the Cleveland Air Agency: General Facility ID # 1318030172. HCC also has a discharge permit with the Northeast Regional Sewer District: Permit # 2911360S1UR3.

I-1g Certification of Closure

Hukill Chemical will send a Closure Certification report covering all units subject to closure to the Director of the Ohio EPA and to other EPA offices (Engineering Unit, NEDO), as required, within 90 days after the completion of final or partial closure. The certification will be signed by the President of Hukill Chemical and by an independent, qualified, registered, professional Engineer.

In accordance with 3745-55- 11 and 12 requirements, the certification document will contain the following:

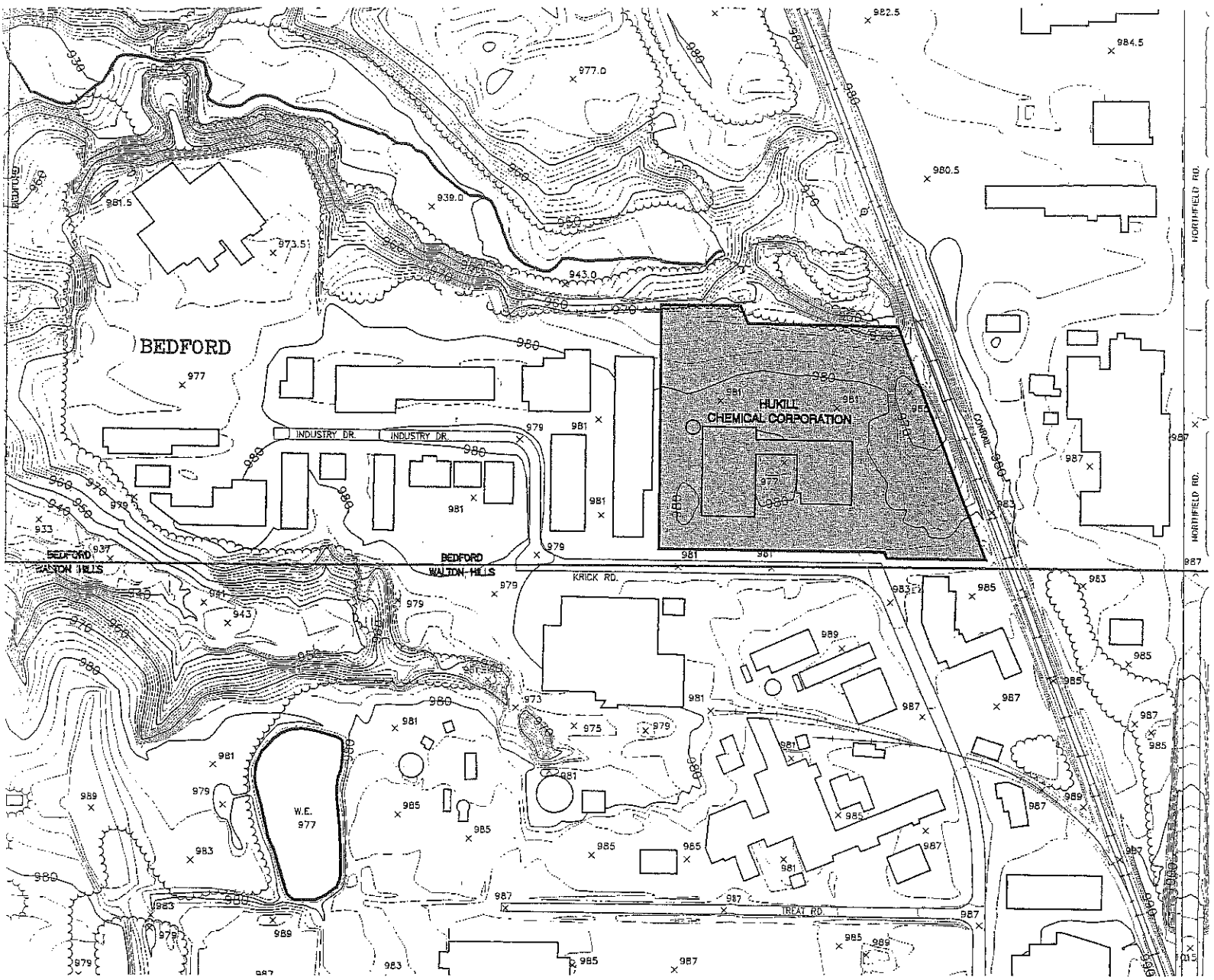
1. The certification statement The statement will include the wording found in OAC 3745-50-42(D).
2. The approved closure plan or reference to the approved Plan.
3. The volume of waste removed.
4. All correspondence regarding closure activity after Ohio EPA approval.
5. Details of sampling and analysis methods.
6. Laboratory records.
7. A narrative describing all activities during closure.
8. Details and drawings pertaining to the area(s) closed as a landfill.
9. Post-closure clean-up documentation.
10. The signature of the owner/operator and of a qualified, independent, registered professional engineer.

I-4 Closure Cost Estimates

I-5 Financial Assurance Mechanism for Closure - Letter of Credit

I-6 Post - Closure Cost Estimate

The latest financial assurance mechanisms and closure cost estimates are maintained at the facility and are available for OEPA inspection. These are provided to OEPA-CO Attn: Mr. Issac Wilder (DHWM) every year as the policy is renewed. Hukill Chemical Corporation is currently using a Hazardous Waste Closure-Post Closure insurance policy as financial assurance mechanism for closure and post-closure.



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DRAWING TITLE

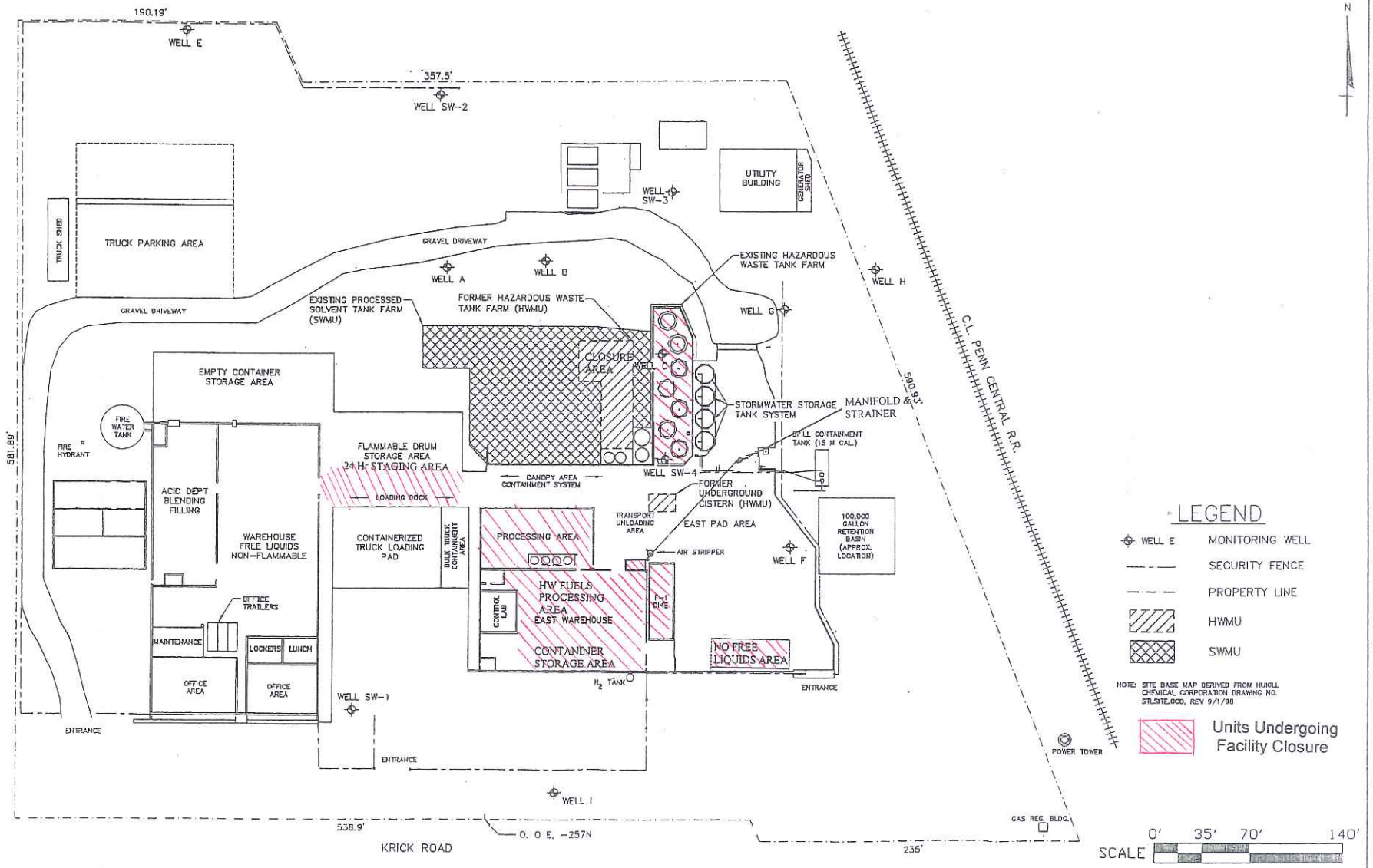
TOPOGRAPHICAL OVERVIEW MAP

ENGINEER	ARCHITECT	DESIGNER
-	-	-
DRAWN BY	REVIEWED BY	SCALE
RPK	JR	1"=200'

RECORDS CONTROL

FBK #	DRAWING NUMBER
10568	1 / 1
CADD FILE # 10568.DWG	
XREF FILE(S) 044-130.DWG 044-135.DWG 048-130.DWG 048-135.DWG	

SECTION I



SECTION I

SITE MAP

HUKILL CHEMICAL CORPORATION
BEDFORD, OHIO

MAY 2004

33621.06

33621X019.DWG

Table I-1

Hazardous Waste Codes Managed at the Facility

Characteristic Wastes:
D001, D002, D003, D004, D005, D006, D007, D008, D009, D010, D011, D012, D013, D014, D015, D016, D017, D018, D019, D020, D021, D022, D023, D024, D025, D026, D027, D028, D029, D030, D031, D032, D033, D034, D035, D036, D037, D038, D039, D040, D041, D042, D043

Listed Wastes:
F001, F002, F003, F004, F005, F006, F019, F024, F025, F037, F038, F039

K009, K010, K014, K015, K016, K017, K018, K019, K020, K021, K022, K023, K024, K026, K028, K029, K030, K048, K049, K050, K051, K052, K060, K061, K062 (containers only), K083, K085, K086, K087, K093, K094, K095, K096, K103, K104, K105, K136, K141, K142

U002, U004, U007, U008, U017, U019, U021, U023, U024, U025, U027, U028, U029, U031, U032, U037, U039, U043, U044, U045, U046, U047, U048, U051, U052, U055, U056, U057, U066, U067, U068, U069, U070, U071, U072, U075, U076, U077, U079, U080, U081, U082, U083, U088, U089, U092, U101, U102, U107, U112, U113, U117, U118, U121, U122, U123, U127, U131, U132, U134, U140, U144, U145, U146, U147, U153, U154, U159, U161, U162, U165, U166, U167, U168, U169, U171, U182, U183, U184, U188, U190, U191, U196, U201, U207, U208, U209, U210, U211, U213, U220, U221, U225, U226, U227, U228, U235, U238, U239, U328, U353, U359.

Some of the above waste codes are managed more frequently than others and some of the waste codes are only managed as storage till they are transferred off-site for treatment and disposal. The following are the more frequently handled waste codes.

D001 - General ignitable waste solvents, flash point less than 140 degrees F, not listed as a hazardous waste in Subpart D of 40 CFR Part 261. May contain any of those waste codes listed above as well as waste having the toxic characteristic.

F001 – The spent hallogenated solvents used in degreasing and other applications; Tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1,-trichloroethane, carbon tetrachloride, the chlorinated flourocarbons and still bottoms from the recovery of these solvents.

F002 – The spent hallogenated solvents; Tetrachloretheylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-tichlore-1,2,2-triflouroethane, otrtho-dichlorobenzene, trichlorofluoromehtane, 1,1,2-trichloroethane and still bottoms from the recovery of these solvents.

F003 – The spent non-hallogenated solvents; xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, methanol, n-butyl alcohol, cyclohexanone and still bottoms from the recovery of these solvents.

F004 – The following non-hallogenated solvents; cresols and cresylic acid, notrobenzene and the still bottoms from the recovery of these solvents.

F005 – The spent non-hallogenated solvents; toluene, methyl ethyl ketone, carbon disufide, isobutanol, pyridine, benzene, 2-ethoxyethanol, 2-nitropropane and the still bottoms from the recovery of these solvents.

K086 – Solvent washes from ink formulations containing chromium and lead.

Table I-2
Tank Storage

RCRA Tanks

Tank No.	*Volume/ Capacity*	*Size*	*Shell Thickness*	*Minimum Thickness Tank Taken Out of Service*	*Materials of Construction*	*Dike Which Tank is Locate In*
Hockmeyer tank	1,000 gal	6' x7'4" high	¼"	0.05"	Steel	Fuels Processing Area
Auger Mix Tank	759 gal	5' x 5.5' high	¼"	0.05"	Steel	Fuels Processing Area
55	16,000 Gal	10.5' x 32' high	¼"	0.131"	Carbon Steel	Bottom/Feed Dike
53	6,000 Gal	8' x 18' high	¼"	0.0464"	Carbon Steel	Bottom/Feed Dike
52	6,000 Gal	8' x 18' high	¼"	0.0464"	Carbon Steel	Bottom/Feed Dike
16	6,000 Gal	10.5' x 17' high	¼"	0.0328"	Carbon Steel	F-1 dike
15	9,500 Gal	9.5' x 24' high	¼"	0.0328"	Carbon Steel	F-1 dike
14	10,000 Gal	10' x 26' high	¼"	0.0328"	Carbon Steel	F-1 dike
56	14,000 Gal	12' x 15'7" high	3/16"	0.071"	Carbon Steel	F-7 Dike
57	14,000 Gal	10.5' x 24' high	3/8"	0.0233"	Carbon Steel	F-7 Dike
58	14,000 Gal	10.5' x 24' high	3/8"	0.0233"	Carbon Steel	F-7 Dike
59	14,000 Gal	10.5' x 24' high	3/8"	0.0233"	Carbon Steel	F-7 Dike
60	14,000 Gal	10.5' x 24' high	3/8"	0.0233"	Carbon Steel	F-7 Dike
61	14,000 Gal	10.5' x 24' high	3/8"	0.0233"	Carbon Steel	F-7 Dike
62	14,000 Gal	10.5' x 24' high	3/8"	0.0233"	Carbon Steel	F-7 Dike
8-3-F	3,000 Gal	7' x 13' high	7 GA	0.134"	Steel	Process Area Dike
9-3-F	3,000 Gal	7' x 13' high	7 GA	0.134"	Steel	Process Area Dike
10-3-F	3,000 Gal	7' x 13' high	7 GA	0.134"	Steel	Process Area Dike
11-3-F	3,000 Gal	7' x 13' high	7 GA	0.134"	Steel	Process Area Dike

Permitted Container Storage Areas

Location	Area (sq. ft.)	Maximum Drums/Bins	
East Warehouse	6,808	916	229
Processing Building	1,200	240	60
East Pad, No Free Liquids	676	360	90

Table I-2 (continued)

Additional Equipment

Disperser Tank (East Warehouse Dike) 1,000 gallons

Auger Tank (East Warehouse Dike) 750 gallons

Strainer/ Manifold (East Pad along East Warehouse)

SAMPLING PARAMETERS AND TEST METHODS
RINSEATE ANALYSIS

Closure toxic constituent analysis for Hazardous Waste Solvent management units.

The following is a list of characteristics or contaminants and the analytical methods to be used for detecting them. Analysis will be conducted, using SW-846 or other approved methods, for detecting the presence of additional toxic constituents that were manifested and placed in a management unit or any additional toxic constituents determined by Hukill Chemical Corporation to have been managed in that unit.

WASTE CODE OR CONSTITUENT	U.S. EPA SW-846 * TEST METHODS	"CLEAN" RINSEATE CONTAMINANT LEVEL, Max. (mg/L)
D001 Ignitability (Setaflash)	ASTM D-3278-78	Greater than 60 Deg.C
D002 Corrosivity	9040	pH = 2.1 to 12.4
Acetone	8260	1.00
Benzene	8260	0.075
n-Butyl Alcohol	8260	1.00
Carbon Disulfide	8260	1.00
Carbon Tetrachloride	8260	0.075
Clororbenzene (Monochlorobenzene)	8260	1.00
Chloroform	8260	1.00
Cresols	8260	1.00
Cresylic Acid	8270	1.00
Cyclohexanone	8260	1.00
2-Ethoxyethanol ("Cellosolve")	8260	1.00
Ethyl Acetate	8260	1.00
Ethyl Alcohol	8260	1.00
Ethyl Benzene	8260	1.00
Ethyl Ether	8260	1.00
Isobutyl Alcohol	8260	1.00
Methanol	8260	1.00
Methylene Chloride (Dichloromethane)	8260	0.075
Methyl Ethyl Ketone (2-Butanone)	8260	1.00
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	8260	1.00
Nitrobenzene	8270	1.00
2-Nitropropane	8260	1.00
Ortho-Dichlorobenzene	8270	1.00
Pyridine	8270	1.00
Tetrachloroethylene	8260	0.075
Tetrahydrofuran	8260	1.00
Toluene	8260	1.00
1,1,1-Trichloroethane	8260	1.00
1,1,2-Trichloroethane	8260	0.075
Trichloroethylene	8260	0.075
Trichlorofluoromethane	8260	1.00
1,1,2-Trichloro-1,2,2-Trifluoroethane	8260	1.00
Vinyl Chloride	8260	0.03
Xylene	8260	1.00
D004 Arsenic	6010, 7060	0.75
D005 Barium	6010, 7080	1.00
D006 Cadmium	6010, 7130	0.075
D007 Chromium	6010, 7190	1.00
D008 Lead	6010, 7420	1.00
D009 Mercury	7470, 7471	0.03

* Third Edition of SW-846 and its revisions.

** At the time of closure the current approved EPA method will be used.

*** The drinking water MCL will be used to determine clean or a risk based standard or other health based standard.

SAMPLING PARAMETERS AND TEST METHODS

SOILS ANALYSIS

Closure toxic constiuent analysis for Hazardous Waste Solvent management units.

The following is a list of characteristics or contaminants and the analytical methods to be used for detecting them. Analysis will be conducted, using SW-846 or other approved methods, for detecting the presence of additional toxic constituents that were manifested and placed in a management unit or any additional toxic constituents determined by Hukill Chemical Corporation to have been managed in that unit.
Total analysis will be conducted on the solids sampled for closure

DE OR CONSTITUENT	U.S. EPA SW-846 * TEST METHODS	SOILS CONTAMINANT LEVEL, Max. (ug/kg)
D001 Ignitability (Setaflash)	ASTM D-3278-78	Greater than 60 Deg.C
D002 Corrosivity	9040	pH = 2.1 to 12.4
Acetone	8260	5
Benzene	8260	5
n-Butyl Alcohol	8260	5
Carbon Disulfide	8260	5
Carbon Tetrachloride	8260	5
Clororbenzene (Monochlorobenzene)	8260	5
Chloroform	8260	5
Cresols	8260	5
Cresylic Acid	8270	660
Cyclohexanone	8260	5
2-Ethoxyethanol ("Cellosolve")	8260	5
Ethyl Acetate	8260	5
Ethyl Alcohol	8260	5
Ethyl Benzene	8260	5
Ethyl Ether	8260	5
Isobutyl Alcohol	8260	5
Methanol	8260	5
Methylene Chloride (Dichloromethane)	8260	5
Methyl Ethyl Ketone (2-Butanone)	8260	5
Methyl Isobutyl Ketone (4-Methyl-2-Pentano	8260	5
Nitrobenzene	8270	660
2-Nitropropane	8260	5
Ortho-Dichlorobenzene	8270	660
Pyridine	8270	660
Tetrachloroethylene	8260	5
Tetrahydrofuran	8260	5
Toluene	8260	5
1,1,1-Trichloroethane	8260	5
1,1,2-Trichloroethane	8260	5
Trichloroethylene	8260	5
Trichlorofluoromethane	8260	5
1,1,2-Trichloro-1,2,2-Trifluoroethane	8260	5
Vinyl Chloride	8260	5
Xylene	8260	5
D004 Arsenic	6010, 7060	13 mg/kg
D005 Barium	6010, 7080	150 mg/kg
D006 Cadmium	6010, 7130	1.25 mg/kg
D007 Chromium	6010, 7190	22 mg/kg
D008 Lead	6010, 7420	37 mg/kg
D009 Mercury	7470, 7471	0.13 mg/kg

* Third Edition of SW-846 and its revisions.
a) Metals values are based on Generic Remediation Standards found in the Closure Review Guidance Document March, 1999
b) Compounds not naturally occuring as specified in the CRGD March 1999 use the Estimated Qantitation Limits (EQLs) for the SW-846 Method.

Figure I-1

Closure Activity	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
1. Closure of Permitted Tanks						
a. Process solvent & fuels	xxxx					
b. Decontaminate Tanks	xxxxxxxxx					
c. Collect final rinse w/PE present		x				
d. Decon tank piping system		xxxxxxxx				
e. Decon Containment Dike		xxxxxxxx				
f. Rinseate sample w/PE present			x			
g. Sample soils PE present			x			
h. Manage any waste from closure			xxxxxxx	xxxxxxxxx	xxxxxxxx	
i. Re decon contingency					xxxxxxxx	
j. Rinseate sample w/PE present						x
k. Prepare report						xxxxxxxx
l. Submit report						x

*Note: Rinse samples will be collected only if needed based on future use or disposition of tanks.
The sample steps in the schedule will be discussed with OEPA prior to implementation of the Closure Plan

2. Closure of Permitted Storage Areas						
a. Process solvent & fuels	xxx					
b. Decontaminate Area	xxxxxxxxx					
c. Collect final rinse w/PE present		x				
e. Decon Containment		xxxxxxxx				
f. Rinseate sample w/PE present			x			
g. Sample soils PE present			x			
h. Manage any waste from closure			xxxxxxxx	xxxxxxxxx	xxxxxxxx	
i. Re decon contingency					xxxxxxxx	
j. Rinseate sample w/PE present						x
k. Prepare report						xxxxxxxx
l. Submit report						x

*Note: Rinse samples will be collected only if needed based on future use or disposition of tanks.
The sample steps in the schedule will be discussed with OEPA prior to implementation of the Closure Plan

3. Closure of Processing Equipment						
a. Process solvent & fuels	xxx					
b. Decontaminate Equipment	xxxxxxxxx					
c. Collect final rinse w/PE present		x				
e. Decon Containment		xxxxxxxx				
f. Rinseate sample w/PE present			x			
g. Manage any waste from closure			xxxxxxx	xxxxxxxxx	xxxxxxxx	
h. Re decon contingency					xxxxxxxx	
i. Rinseate sample w/PE present						x
j. Prepare report						xxxxxxxx
k. Submit report						x

*Note: Rinse samples will be collected only if needed based on future use or disposition of tanks.
The sample steps in the schedule will be discussed with OEPA prior to implementation of the Closure Plan

Note: Ohio EPA will be notified 45 days prior to commencing closure.
Note: In addition Ohio EPA will be notified 5 days prior to commencing any major activities as agreed prior to implementation of the Closure Plan.

SAMPLING PARAMETERS AND TEST METHODS
RINSEATE ANALYSIS

Closure toxic constiuent analysis for Hazardous Waste Solvent management units.

The following is a list of characteristics or contaminants and the analytical methods to be used for detecting them. Analysis will be conducted, using SW-846 or other approved methods, for detecting the presence of additional toxic constituents that were manifested and placed in a management unit or any additional toxic constituents determined by Hukill Chemical Corporation to have been managed in that unit.

WASTE CODE OR CONSTITUENT	U.S. EPA SW-846 * TEST METHODS	"CLEAN" RINSEATE CONTAMINANT LEVEL, Max. (mg/L)
D001 Ignitability (Setaflash)	ASTM D-3278-78	Greater than 60 Deg.C
D002 Corrosivity	9040	pH = 2.1 to 12.4
Acetone	8260	1.00
Benzene	8260	0.075
n-Butyl Alcohol	8260	1.00
Carbon Disulfide	8260	1.00
Carbon Tetrachloride	8260	0.075
Clororbenzene (Monochlorobenzene)	8260	1.00
Chloroform	8260	1.00
Cresols	8260	1.00
Cresylic Acid	8270	1.00
Cyclohexanone	8260	1.00
2-Ethoxyethanol ("Cellosolve")	8260	1.00
Ethyl Acetate	8260	1.00
Ethyl Alcohol	8260	1.00
Ethyl Benzene	8260	1.00
Ethyl Ether	8260	1.00
Isobutyl Alcohol	8260	1.00
Methanol	8260	1.00
Methylene Chloride (Dichloromethane)	8260	0.075
Methyl Ethyl Ketone (2-Butanone)	8260	1.00
Methyl Isobutyl Ketone (4-Methyl-2-Pentanone)	8260	1.00
Nitrobenzene	8270	1.00
2-Nitropropane	8260	1.00
Ortho-Dichlorobenzene	8270	1.00
Pyridine	8270	1.00
Tetrachloroethylene	8260	0.075
Tetrahydrofuran	8260	1.00
Toluene	8260	1.00
1,1,1-Trichloroethane	8260	1.00
1,1,2-Trichloroethane	8260	0.075
Trichloroethylene	8260	0.075
Trichlorofluoromethane	8260	1.00
1,1,2-Trichloro-1,2,2-Trifluoroethane	8260	1.00
Vinyl Chloride	8260	0.03
Xylene	8260	1.00
D004 Arsenic	6010, 7060	0.75
D005 Barium	6010, 7080	1.00
D006 Cadmium	6010, 7130	0.075
D007 Chromium	6010, 7190	1.00
D008 Lead	6010, 7420	1.00
D009 Mercury	7470, 7471	0.03

* Third Edition of SW-846 and its revisions.

** At the time of closure the current approved EPA method will be used.

*** The drinking water MCL will be used to determine clean or a risk based standard or other health based standard.

SAMPLING PARAMETERS AND TEST METHODS

SOILS ANALYSIS

Closure toxic constiuent analysis for Hazardous Waste Solvent management units.

The following is a list of characteristics or contaminants and the analytical methods to be used for detecting them. Analysis will be conducted, using SW-846 or other approved methods, for detecting the presence of additional toxic constituents that were manifested and placed in a management unit or any additional toxic constituents determined by Hukill Chemical Corporation to have been managed in that unit.
Total analysis will be conducted on the solids sampled for closure

DE OR CONSTITUENT	U.S. EPA SW-846 * TEST METHODS	SOILS CONTAMINANT LEVEL, Max. (ug/kg)
D001 Ignitability (Setaflash)	ASTM D-3278-78	Greater than 60 Deg.C
D002 Corrosivity	9040	pH = 2.1 to 12.4
Acetone	8260	5
Benzene	8260	5
n-Butyl Alcohol	8260	5
Carbon Disulfide	8260	5
Carbon Tetrachloride	8260	5
Clororbenzene (Monochlorobenzene)	8260	5
Chloroform	8260	5
Cresols	8260	5
Cresylic Acid	8270	660
Cyclohexanone	8260	5
2-Ethoxyethanol ("Cellosolve")	8260	5
Ethyl Acetate	8260	5
Ethyl Alcohol	8260	5
Ethyl Benzene	8260	5
Ethyl Ether	8260	5
Isobutyl Alcohol	8260	5
Methanol	8260	5
Methylene Chloride (Dichloromethane)	8260	5
Methyl Ethyl Ketone (2-Butanone)	8260	5
Methyl Isobutyl Ketone (4-Methyl-2-Pentano	8260	5
Nitrobenzene	8270	660
2-Nitropropane	8260	5
Ortho-Dichlorobenzene	8270	660
Pyridine	8270	660
Tetrachloroethylene	8260	5
Tetrahydrofuran	8260	5
Toluene	8260	5
1,1,1-Trichloroethane	8260	5
1,1,2-Trichloroethane	8260	5
Trichloroethylene	8260	5
Trichlorofluoromethane	8260	5
1,1,2-Trichloro-1,2,2-Trifluoroethane	8260	5
Vinyl Chloride	8260	5
Xylene	8260	5
D004 Arsenic	6010, 7060	13 mg/kg
D005 Barium	6010, 7080	150 mg/kg
D006 Cadmium	6010, 7130	1.25 mg/kg
D007 Chromium	6010, 7190	22 mg/kg
D008 Lead	6010, 7420	37 mg/kg
D009 Mercury	7470, 7471	0.13 mg/kg

* Third Edition of SW-846 and its revisions.
a) Metals values are based on Generic Remediation Standards found in the Closure Review Guidance Document March, 1999
b) Compounds not naturally occuring as specified in the CRGD March 1999 use the Estimated Qantitation Limits (EQLs) for the SW-846 Method.

SANITARY SEWER LIMITS FOR DISCHARGE		
List of acceptable limits for toxic constituents discharged to the sanitary sewer.		
The following are the current NEORD limits.		
Any discharges to the sanitary sewer during closure will be subject to the limits in effect at that time.		
	U.S. EPA SW-846 *	
WASTE CODE OR CONSTITUENT	TEST METHODS	LIMITS (mg/l)
pH	9040	pH = 5.0 to 10
Carbon Disulfide	5030, 8015, 8240	25
Carbon Tetrachloride	5030, 8010, 8240	**
Clororbenzene	5030, 8010, 8240	25
Cresols	5030, 8040, 8250	25
Cresylic Acid	5030, 8040, 8250	25
Isobutyl Alcohol	8240	25
Methylene Chloride	5030, 8010, 8240	25
Methyl Ethyl Ketone (2-Butanone)	5030, 8015, 8240	250
Nitrobenzene	8250	25
Tetrachloroethylene	5030, 8010, 8240	**
Toluene	5030, 8015, 8240	25
1,1,1-Trichloroethane	5030, 8010, 8240	25
Trichloroethylene	5030, 8010, 8240	**
Cholorfluorocarbons	8240	25
Cadmium	6010, 7130	2
Chromium (Total)	6010, 7190	25
Lead	6010, 7420	2
Maximum combined solvent limitation is 250 mg/l. Applies to ALL combined solvents, not just those listed above.		
* Third Edition of SW-846 and its revisions.		
** Maximum combined concentration is 1 mg/l.		
\PARTB-6\TAB!-4.XLS		

Supplementary Effluent Limitations (cont.)

Parameter	Concentration (mg/L)
Iron	50
Zinc	15
Lead	2
Amenable Cyanide	2
Total Cyanide	10
Phenols	50
Carbon Tetrachloride	(i)
Tetrachloroethylene	(i)
Trichloroethylene	(i)
Methylene Chloride	25
1,1,1-Trichloroethane	25
Chlorobenzene	25
Creosols	25
Cresylic Acid	25
Nitrobenzene	25
Toluene	25
Carbon Disulfide	25
Isobutanol	25
Spent Chlorofluorocarbon Solvents	25
Methyl Ethyl Ketone	250
Maximum Combined Solvents	**250**

(i) - Maximum combined concentration is 1mg/L.

C. As per the District's Code of Regulations Section 2.0301: General Discharge Prohibitions - **Hukill Chemical** shall not discharge or cause to be discharged, directly or indirectly, any of the following described substances into the wastewater disposal system or otherwise to the facilities of the District:

(a) Any liquids, solids or gases which by reason of their nature or quantity are, or may be, sufficient either alone or by interaction to cause fire or explosion or be injurious in any other way to the operation of the sewer system or wastewater treatment facility, including, but not limited to, wastestreams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test method specified in 40 CFR 261.21.

(b) Solid or viscous substances which will or may cause obstruction to the flow in a sewer or other interference with the operation of the wastewater system.

(c) Any wastewater having a pH less than 5.0 or higher than 12.5 standard units (SU) or having any other corrosive property capable of causing damage or hazard to structures, equipment, or personnel of the system.

Section I Table 4a

PART 1 – PROCESS/OPERATIONAL DESCRIPTION

A. **Hukill Chemical** is employed in solvent reclamation and chemical distribution. These processes are regulated by **40 CFR 403 – General Pretreatment Regulations for Existing and New Sources of Pollution.**

PART 2 - EFFLUENT LIMITATIONS

A. During the period of June 17, 2002, to April 30, 2007, **Hukill Chemical** is authorized to discharge industrial process wastewater and stormwater to the District's sewerage collection/treatment system from the discharge point(s) listed below. All process and stormwater discharges from **Hukill Chemical** shall be in compliance with limitations promulgated and required under the District's Code of Regulations and required under the Code of Federal Regulations Section **40-CFR-403 – General Pretreatment Regulations for Existing and New Sources of Pollution.**

Description of Discharge Point(s):

Discharge Point	Description
01	Discharge Point is the four (4) storage tanks located in the tank farm at the northeast quadrant of the property. This point discharges to the municipal sewer via the 100% manhole on Krick Road. Effluent from this point consists of collected stormwater from the contaminated and uncontaminated areas of the facility.
02	Discharge Point is the sewer lateral located in the acid blending area. This point receives flow from the acid blending tank cleaning which is pumped to the sewer lateral via a sewer cleanout. This point discharges to the municipal sewer via the 100% manhole on Krick Road.

B. **Hukill Chemical** shall not discharge wastewater above the Supplementary Limitations contained in Section 2.0305 of the District's Code of Regulations. Supplemental limits apply to the total combined wastewater flow discharged to the municipal sewer by **Hukill Chemical** from any industrial or non-industrial points located at their facility.

Supplementary Effluent Limitations

Parameter	Concentration (mg/L)
Cadmium	2
Chromium Hexavalent	10
Chromium Total	25
Copper	3
Nickel	10

Section I Table 4a

SCHEDULE FOR CLOSURE

(Schedule Begins After Approval of Closure Plan by Ohio EPA)

TIME SCHEDULE (MONTHS)

CLOSURE ACTIVITY	1	2	3	4	5	6	7	8	9	10 thru 12	13	14	15
1. Closure of Permitted H.W. Solvent Tank Systems:													
a. On-site processing of solvents & fuels	****	****	**										
b. Decontamination of H.W. storage tanks				****	****								
c. Rinseate testing with Registered P.E. present						**							
d. Decon. of storage tank system piping, etc.						****							
e. Decontamination of storage tank dikes							****						
f. Rinseate testing with Registered P E present								**					
g. Sampling and testing of contam. soil & debris								****					
h. Labeling and shipment of soil and debris									**				
i. Allowance for inclement weather										*--------*			
2. Closure of Container Storage and Handling Units:													
a. On-site processing of solvents & fuels			****										
b. Decon. of storage areas and handling equip.				****	****								
c. Rinseate testing with Registered P E present						**							
d. Sampling and testing of contam. soil & debris							****						
e. Labeling and shipment of soil and debris								*					
3. Closure of Processing Equipment and Transports:													
a. Decon. of Processing Equipment						****							
b. Decon. of H.W. transport trailers							****						
c. Rinseate testing with Registered P E present								*					
d. Sampling and testing of contam. soil & debris								***					
e. Labeling and shipment of soil and debris									*				
4. Closure of Corrosives Container Storage Area:													
a. On-site processing - neutralization of corrosiv			****										
b. Decon. of storage areas and handling equip.				**									
c. Rinseate testing with Registered P E present						**							
d. Sampling and testing of contam. soil & debris							****						
e. Labeling and shipment of soil and debris								**					
5. Closure of H.W. Corrosives Tank Systems:													
a. Processing of Spent Corrosives			****										
b. Decontamination of tanks & piping				**									
c. Decontamination of dike areas					**								
d. Rinseate testing with Registered P.E. Present						**							
e. Labeling and prep. for shipment, if required						**							
f. Ship rinseate to TSDF, if required							*						
g. Allowance for inclement weather							***	****	****	*			
6. Testing to Detect H.W Migration from Units:													
a. Core samples - areas around and under units										**			
b. Analysis of samples and report										****			
c. Review of report by Registered P.E.										****			
d. Allowance for inclement weather											****	****	****
7. If Required. Submit Sampling Plan to OEPA	Within 60 days after core sample review by P.E.												
8. If Required. Submit Remediation Plan to OEPA			Within 90 days after approval of Sampling Plan by OEPA										
9. Submittal of Closure Certification signed by Owner and Reg. P. E.	Within sixty days of completion of closure.												

Note: Ohio EPA to be notified 5 days prior to commencement of major activities as agreed upon prior to implementation of Closure Plan.

* Equals approx. one week. *------* Equals three months.

Figure I-1

Closure Activity	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
1. Closure of Permitted Tanks						
a. Process solvent & fuels	xxxx					
b. Decontaminate Tanks	xxxxxxxxx					
c. Collect final rinse w/PE present		x				
d. Decon tank piping system		xxxxxxxx				
e. Decon Containment Dike		xxxxxxxx				
f. Rinseate sample w/PE present			x			
g. Sample soils PE present			x			
h. Manage any waste from closure			xxxxxxx	xxxxxxxxx	xxxxxxxx	
i. Re decon contingency					xxxxxxxx	
j. Rinseate sample w/PE present						x
k. Prepare report						xxxxxxxx
l. Submit report						x

*Note: Rinse samples will be collected only if needed based on future use or disposition of tanks.
The sample steps in the schedule will be discussed with OEPA prior to implementation of the Closure Plan

2. Closure of Permitted Storage Areas						
a. Process solvent & fuels	xxx					
b. Decontaminate Area	xxxxxxxxx					
c. Collect final rinse w/PE present		x				
e. Decon Containment		xxxxxxxx				
f. Rinseate sample w/PE present			x			
g. Sample soils PE present			x			
h. Manage any waste from closure			xxxxxxxx	xxxxxxxxx	xxxxxxxx	
i. Re decon contingency					xxxxxxxx	
j. Rinseate sample w/PE present						x
k. Prepare report						xxxxxxxx
l. Submit report						x

*Note: Rinse samples will be collected only if needed based on future use or disposition of tanks.
The sample steps in the schedule will be discussed with OEPA prior to implementation of the Closure Plan

3. Closure of Processing Equipment						
a. Process solvent & fuels	xxx					
b. Decontaminate Equipment	xxxxxxxxx					
c. Collect final rinse w/PE present		x				
e. Decon Containment		xxxxxxxx				
f. Rinseate sample w/PE present			x			
g. Manage any waste from closure			xxxxxxx	xxxxxxxxx	xxxxxxxx	
h. Re decon contingency					xxxxxxxx	
i. Rinseate sample w/PE present						x
j. Prepare report						xxxxxxxx
k. Submit report						x

*Note: Rinse samples will be collected only if needed based on future use or disposition of tanks.
The sample steps in the schedule will be discussed with OEPA prior to implementation of the Closure Plan

Note: Ohio EPA will be notified 45 days prior to commencing closure.
Note: In addition Ohio EPA will be notified 5 days prior to commencing any major activities as agreed prior to implementation of the Closure Plan.

Tank Farm Revised
RCRA Closure Plan
And
RCRA Corrective Measures
Implementation Plan

Originally Prepared By
Earth Tech
May 2000
Revised April 2001
Revised June 2005

Revised RCRA Closure Plan

Hukill Chemical Corporation
7013 Krick Road
Bedford, Ohio 44146
US EPA No. OHD 001 926 740
Ohio Permit No. 02-18-0315

Prepared for:
Hukill Chemical Corporation
Bedford, Ohio

Prepared by:
Earth Tech
2 Market Plaza Way
Mechanicsburg, PA 17055

May 2000
REVISED APRIL 2001
REVISED JUNE 2005

H:Hukill\Public\SafetyEnv\Closure\Master Closure Plan

1.0 INTRODUCTION

This revised RCRA Closure Plan (Closure Plan) addresses written comments submitted by the OEPA on the previously submitted Closure Plans, if applicable, and replaces the previous plans in full. THIS EARTH TECH CLOSURE PLAN HAS ALSO BEEN REVISED IN RESPONSE TO A MARCH 26, 2001 NOTICE OF DEFICIENCY (NOD) FROM THE OEPA. Earth Tech utilized the following documents in the development of this Closure Plan: Closure Plan Review Guidance for RCRA Facilities, prepared by OEPA, Division of Hazardous Waste Management, March 1999; and, the Ohio Administrative Code (OAC). Excerpts and Figures from previously submitted Closure Plans by Eder and Leader have also been included. These Figures and excerpts are the property of HCC.

1.1 OBJECTIVES

The objectives of this Closure Plan are to:

- Present a revised approach to closure of the former hazardous waste tank farm and the former underground cistern both of which are regulated hazardous waste management units (HWMU's);
- Address previous comments from the Ohio Environmental Protection Agency (OEPA) as they pertained to prior Closure Plans prepared by Eder Associates Consulting Engineers, P.C. (Eder) and Leader Environmental, Inc. (Leader); ~~and,~~
- Address previous OEPA comments to an Earth Tech, Inc. (Earth Tech) Detailed Closure Proposal (DCP, Earth Tech 1999) submitted on November 11, 1999; AND,
- ADDRESS COMMENTS FROM THE OEPA IN RESPONSE TO THE MARCH 26, 2001 NOD LETTER.

1.2 ORGANIZATION

This Closure Plan is generally organized to follow the requirements outlined in the OEPA Closure Plan Review Guidance for RCRA Facilities. The Closure Plan includes the following sections:

- Description of Facility and Environmental Conditions (Section 2.0);
- Description of Hazardous Waste Management Units To Be Closed (Section 3.0);
- Approach to Closure (Section 4.0);
- Closure Contingency Plan (Section 5.0);
- Schedule for Closure (Section 6.0);
- Personnel Health and Safety (Section 7.0);
- Decontamination Protocols (Section 8.0);
- Site Security (Section 9.0);
- Closure Certification and Notations (Section 10.0);
- Post-closure Plan and Care (Section 11.0); and,
- References (Section 12.0).

2.0 DESCRIPTION OF FACILITY AND ENVIRONMENTAL CONDITIONS

This section provides a general description of the Site and discusses the Site geology and hydrogeology based upon previously completed site investigations performed by Eder.

2.1 GENERAL SITE DESCRIPTION

HCC owns and operates a chemical distribution center and solvent recovery facility, which is located in an industrial park at 7013 Krick Road, Bedford, Cuyahoga County, Ohio. The Site location is shown on Figure 1. HCC has been in business since 1968 at the same address. Prior to this, Best Foundry, a manufacturer of military cannons during World War I, was reported to be in this location.

Operations at HCC involve the processing of hazardous waste solvents. These materials are delivered in 55-gallon drums or in bulk, via tank trucks, and are stored for a short time prior to processing. Solvents are distilled and stored prior to shipment off-site for reuse. Residues generated from processing operations are shipped off-site to approved treatment/disposal facilities. The Site Base Map is shown on Figure 2. As discussed above, the Site contains regulated HWMUs subject to RCRA closure requirements and SWMUs subject to RCRA corrective action requirements. Figure 3 presents the location of the two HWMUs and one remaining SWMU on the Site.

2.1.1 Local Land Use

The facility is surrounded by an auto salvage yard, a cement processor, a hazardous waste solidification facility and a vacant parcel previously utilized in manufacturing brake shoes. The area in the immediate vicinity of the Site is industrial and has been an industrial area for many years.

2.1.2 Site Utilities

The Site and surrounding facilities all utilize public water and sewer. Therefore, groundwater in the vicinity of the Site is not utilized for consumptive purposes. Subsurface water and sewer lines enter the property from Krick Road, but are not considered to be preferential pathways for the migration of contaminants. Power and phone service is provided via overhead lines.

2.2 HYDROLOGY

The topography of the Site is relatively flat with a general slope to the north. Along the northern edge of the Site, the surface topography drops steeply into a small intermittent tributary of Tinkers Creek (Tributary). Tinkers Creek flows west-southwest into Deerlick Run, which discharges to the Cuyahoga River. The Cuyahoga River flows north-northwest and eventually discharges into Lake Erie.

The Tributary historically flowed across the northeastern portion of the Site and discharged into the small depression. However, HCC enclosed the entire portion of the Tributary on their property in 1989 to accommodate construction/expansion plans. Although the surface topography is relatively flat, surface

grading and filling activities have changed the hydrology of the Site significantly. The surface topography historically graded northeasterly towards the Tributary.

Most of the stormwater that is generated from precipitation falling within process areas is captured and contained via a stormwater collection and treatment system. This system reduces the amount of infiltration and runoff from the Site.

2.3 GEOLOGY

2.3.1 Fill

Based upon soil borings conducted in 1986 and 1988, the Site is underlain by fill material ranging in thickness from one foot to over 25 feet. The fill consists of construction debris and general soil fill consisting of gravel, and silty to sandy clay. North of the tank farm area, in the vicinity of the new HCC Plant 2, a material known as "Chem-Pack" was used as fill. This material is considered a non-hazardous solid waste formed by the solidification of pickle liquor. Although most of the fill overlies native soil, the fill material immediately overlies the fractured shale bedrock in some areas of the Site. Although this area was initially identified as a SWMU, it was removed from the list of SWMUs/HWMUs requiring further evaluation.

2.3.2 Native Soil

Soils underlying the fill consist of glacial till deposited during the Illinoian stage of glacial movement. These soils consist of silty-clay till which varies in thickness from approximately 2 feet to 10 feet. The till is dense with a very low permeability. The till pinches out into the small depression bordering the northern edge of the property.

Along the northern and eastern edges of the Site, the surface topography drops into a small intermittent tributary of Tinkers Creek. Tinkers Creek flows into Deerlick Run before it reaches the Cuyahoga River, and eventually flows into Lake Erie. Unconsolidated glacial deposits pinch out north of the Site. The unconsolidated glacial deposits are comprised of interbedded clays, silty clay, sandy clay and laminated silts with interbedded layers of organic clay and silt.

2.3.3 Bedrock

The silty clay till is underlain by shale bedrock (Meadville Shale). The shale is weathered for approximately 25 feet and then becomes less fractured and less permeable, acting as an aquiclude. The shale bedrock outcrops along Tinkers Creek, northwest of the Site. Groundwater principally exists in the weathered shale, although localized areas of perched groundwater are present where the silty clay till is encountered.

2.4 HYDROGEOLOGY

Eder performed site investigations in 1986 and 1988 related to the CAFO. These investigations involved the installation of soil borings and groundwater monitoring wells. There are currently 12 groundwater monitoring wells located on the HCC property. Earth Tech coordinated the installation of a new upgradient monitoring well (Well I) in 1999 to replace well SW-1. Well SW-1 is proposed to be abandoned sometime in the year 2000, as discussed in detail below.

Groundwater principally occurs in the fractured, weathered shale, which is located below the glacial till and above the more consolidated weathered gray shale, which forms the lower aquifer. A perched water zone has also been defined on site.

2.4.1 Perched Groundwater

The perched water is located above the low permeability clay till deposits in areas containing fill material. However, given that the till is not continuous across the Site, the perched zones also do not extend throughout the Site and are considered hydraulically in communication with the fractured shale (lower aquifer). The groundwater levels in the perched zones beneath the Site apparently vary quite significantly depending on the frequency and duration of precipitation events.

2.4.2 Groundwater Flow and Gradient

Groundwater across the Site typically ranges in depth from 10 to 25 feet below ground surface, in the range of 943 to 975 feet above mean sea level (amsl). Shallow wells are fitted with 5-foot screens. A deep well (Well D) was drilled to a depth of 44 feet in 1986, with casing installed to 34 feet. The bottom 10 feet remained open. No groundwater was detected in this well after one week and the well was abandoned. This confirms the impermeable nature of the gray shale. Downward migration of shallow groundwater is precluded by the shale and does not enter the underlying Berea or Sharpsville Sandstone aquifers.

Groundwater found in the fractured, weathered shale is confined to a narrow zone located near the till/weathered shale interface and flows in a northerly direction into Tinkers Creek, which forms the northern boundary of the Site. Hydrologic gradients increase from 0.022 ft./ft. in southern sections of the Site to over 0.08 ft./ft. in the northern section (Eder, April 1987). Although historic groundwater contour maps showed a northeasterly component of flow, groundwater flows in a northerly or northwesterly direction in more recent Groundwater Contour Maps. Figures 4, 5, 6 and 7 are Groundwater Contour Maps prepared from groundwater level monitoring conducted by Solar Testing Laboratories, Inc. (Solar Testing) in 1999 and 2000. The enclosed Tributary and associated backfill could serve as a hydrologic barrier that would also cause groundwater to preferentially flow in a more northerly direction.

Permeabilities of the silty till have been measured previously by Eder and were found to be 2.8×10^{-5} cm/sec. The permeability of the clayey till ranged from 2.2×10^{-8} cm/sec. and 8.6×10^{-8} cm/sec. Eder performed hydraulic conductivity testing on Wells A and B using the falling head test method. The permeability in Well B was estimated to be 4.23×10^{-8} cm/sec. or 1.2 feet/day. Well A recovered too quickly to measure any change in water level, therefore its permeability is assumed to be quite high.

Permeability across the Site is believed to vary considerably and is controlled by fractures in the weathered shale.

2.5 CONSTITUENTS OF CONCERN AND DISTRIBUTION

During the course of completing prior site investigations, constituents detected in soil and groundwater samples at elevated concentrations were utilized to develop a site-specific list of Constituents of Concern (COCs). These COCs are also defined in HCCs approved Part B Permit and monitoring for these constituents is a permit requirement.

Although several of these constituents were historically detected in the small tributary that crosses the Site, the concentrations in upstream samples exceeded the concentration in downstream samples. Although the source or sources of the upstream impacts was not determined, the sampling confirmed that any COC discharges from HCC into the tributary were not materially degrading the stream quality.

2.5.1 Constituents of Concern (COC's)

Various chlorinated VOC's have been found above the laboratory detection limit in soil samples collected at the Site, including: Tetrachloroethylene (PCE); Trichloroethylene (TCE); 1,1,1 Trichloroethane (TCA); Trans 1,2 Dichloroethylene (Trans 1,2 DCE); 1,1 Dichloroethane (DCA); Methylene Chloride (MC); and Vinyl Chloride (VC), with MC present in the highest concentrations. The following ketones and petroleum hydrocarbons have also been found above the laboratory detection limit in soil, although they are generally present at lower concentrations: acetone; 2-butanone (MEK); methyl iso-butyl ketone (MIBK); 4-methyl-2-pentanone; ethyl benzene; toluene; and, xylenes. The total VOC concentration initially exceeded 7,000 mg/l in groundwater at the primary source area.

A variety of inorganic constituents were found at concentrations above the laboratory detection limit, although no inorganic constituents were present at elevated concentrations, and as such, no inorganic parameters are considered COCs.

2.5.2 COC Distribution in Soil

2.5.2.1 Solvent Tank Farm

Figure 8 presents the location of soil borings and area exhibiting elevated COC concentrations in the vicinity of the solvent tank farm. COCs were generally detected throughout the entire tank farm and extending just beyond the earthen berms to the north. Figures 9 and 10 are cross-sectional perspectives of the Solvent Tank Farm area showing the vertical distribution of COCs in soil. As shown in these figures, COCs were detected throughout the soil profile. In general, the COC concentrations were higher at depth.

2.5.2.2 Former Underground Cistern

Figure 8 also presents the location of soil borings and area exhibiting elevated COC concentrations in the vicinity of the former underground cistern. COCs were found to extend beyond the immediate vicinity of the cistern in all directions. COCs were also detected throughout the soil profile. In general, the COC concentrations were higher at depth. Figure 11 is a cross-sectional perspective of the former underground

cistern showing the vertical distribution of COCs in soil. As shown in Figure 12, the cistern was constructed directly on the weathered shale bedrock. Therefore, releases of COCs from the cistern were able to directly enter the groundwater.

2.5.3 COC Distribution in Groundwater

Figure 13 is a Total VOC Isoconcentration Map showing total VOC concentrations in groundwater in April 1988. Figure 14 is a Total VOC Isoconcentration Map showing total VOC concentrations in groundwater in November 1998. Figure 15 is a combination of Figures 13 and 14, showing the Total VOC concentration in groundwater had not materially changed in over ten years (April 1988 versus November 1998). Figure 16 and Figure 17 are Total VOC Isoconcentration Maps showing total VOC concentrations in groundwater in February 1999 and March 2000, respectively.

Well C has historically and continues to contain the highest concentration of COCs. Figure 18 is a graph showing the total VOC concentrations in well C since it was installed in 1986. Well SW-3 is a downgradient well located directly downgradient of well C. Figure 19 is a graph showing the Total VOC concentrations in well SW-3 since it was installed in 1986. Table 1 is the cumulative groundwater database that has been compiled since May 1986. As presented in these figures and table, the VOC concentrations have dropped dramatically and negligible detections of VOCs in downgradient monitoring wells have been recorded. Laboratory analytical reports for the March 2000 sampling event are presented in Appendix B.

Methylene Chloride has been, and remains, the COC present at the highest concentration. It has dropped from a historic high of 7,400 mg/l in well C to as low as 30.3 mg/l in well C during the November 1997 sampling event. More recently, the concentration has been at 230.13 mg/l. Figure 20 is a Methylene Chloride Isoconcentration Map showing the Methylene Chloride concentration in groundwater in March 2000. Figure 21 is a graph showing the Methylene Chloride concentration in well C since it was installed in 1986. Although the latest concentration is somewhat higher, this relatively small increase is considered a normal fluctuation that can result from varying amounts of precipitation and due to groundwater level fluctuations. Similar fluctuations have been noted since 1997 when routine quarterly sampling was initiated and can be seen on Figure 21. Well SW-4 is also downgradient of the primary source area and has exhibited a decreasing Methylene Chloride concentration trend as depicted on Figure 22.

Wells A, B, C and SW-4 are the only wells that currently exhibit a concentration above the Maximum Contaminant Levels (MCLs) as promulgated by the Safe Drinking Water Act (SDWA). All of these wells are located in the vicinity of the primary source area (solvent tank farm). There have also been historic exceedences of the MCLs in wells F, G, and SW-1, 2, and 3, although these wells have not exhibited concentrations exceeding the MCLs for quite some time. Wells SW-2 and SW-3 are located within the property and downgradient of the primary source area.

2.6 NATURAL ATTENUATION MONITORING

Leader initiated natural attenuation monitoring at the Site in 1997 to assess the potential for using monitored natural attenuation as a remedy for groundwater impacts at the Site. Although this data can be utilized for a general assessment, Leader did not monitor several key parameters. The U.S. Environmental Protection Agency's (EPA) Office of Research and Development and Office of Solid Waste and Emergency Response defines natural attenuation as:

> The biodegradation, dispersion, dilution, sorption, volatilization, and/or chemical and biochemical stabilization of contaminants to effectively reduce contaminant toxicity, mobility, or volume to levels that are protective of human health and the ecosystem (USEPA, 1997).

Natural attenuation processes, such as biodegradation, are often the dominant factors in the fate and transport of contaminants in the environment. Intrinsic remediation in groundwater systems results from the integration of several subsurface attenuation mechanisms that are classified as either destructive or nondestructive (USEPA, 1997). The nondestructive mechanisms include sorption, dispersion, dilution and volatilization. The hydrogeologic characteristics of the aquifer and the chemical properties of the contaminants directly influence these processes. A fundamental understanding of these processes is required in order to assess natural attenuation.

Of the destructive mechanisms involved in natural attenuation, biodegradation of the contaminants is the most important mechanism and may represent a long-term solution to soil and groundwater impacts. Demonstration and quantification of *in situ* biodegradation requires an understanding of the interaction between the environment, COCs and indigenous microorganisms. The natural attenuation evaluation presented herein focuses on assessing the extent of *in situ* biological mechanisms at the Site that could facilitate the attenuation of the contaminants.

2.6.1 Verification of Natural Attenuation

In general, evidence of natural attenuation requires verification along three lines of evidence:

First Line of Evidence – Stable or Decreasing Concentrations. Historical trends in the concentrations of target compounds found at a Site are useful for the calculation of rates of degradation and for the approximation of mass removal;

Second Line of Evidence – Biogeochemical Conditions. Biological and geochemical evidence in samples from the Site can be used to develop a strong case for degradative activity. Biogeochemical characterization includes the analysis of parameters that document subsurface conditions, and the presence of degradation products of dehalogenation; and

Third Line of Evidence – Presence of Microorganisms. Microbiological laboratory assays can be used to detect the presence of a viable microbial community capable of degrading the target compounds under natural conditions.

Stable or Decreasing Concentrations: Specific temporal and spatial trends in groundwater contaminant concentrations can be used to demonstrate natural attenuation. Contaminant concentrations, measured at a given point, can be analyzed and classified as increasing, decreasing, or stable in time. The condition of decreasing or stable groundwater concentrations with respect to time is a strong indication that natural attenuation is occurring. Even in the presence of a continuing source of groundwater contamination (i.e., residual soil contamination in the saturated zone), contaminant concentrations can be decreasing or stable.

Biogeochemical Conditions: Biogeochemical indicator parameters are another line of evidence used to verify natural attenuation. Collectively, these parameters indicate degradation potential, and offer signs of past and current biotic and abiotic activities. Biochemical factors include the concentration of compounds required for microbial metabolism, and the concentration of metabolic intermediates (daughter products). Of all the biogeochemical data, perhaps the most obvious indicators of reductive dechlorination are the presence of the sequential daughter products of PCE/TCE, 1,1,2-TCA, 1,2-DCA and *cis*-1,2-DCE degradation, such as *cis*-1,2-DCE, 1,2-DCA, chloroethane, VC and chloride. The detection of dissolved chloroethane and VC, compounds that are generally in gaseous phase, are clear indications of their generation as daughter products of the biodegradation processes.

The concentration of potential electron donors (food) and terminal electron acceptors (TEAPs, energy) are also important when evaluating biodegradation potential. The concentrations of TEAPs are important indicators of the predominant microbial processes that may be ongoing in a subsurface environment impacted with organic compounds. Under anaerobic conditions, organic compounds may be degraded by nitrate-reducing, manganese-reducing, iron-reducing, sulfate-reducing and methanogenic bacteria. The concentration of the potential terminal electron acceptors nitrate, manganese, iron, and sulfate are therefore discussed below.

Geochemical factors, e.g., pH, ORP, DO, alkalinity (an estimate of the CO_2 that is produced during nitrate reduction), and temperature define subsurface environmental conditions that affect the extent of in situ biodegradation processes. Identification of favorable environmental conditions is indicative that these natural processes are likely occurring.

Ammonia-nitrogen, phosphates and nitrate (which is also a TEAP) are nutrients that are also required by microorganisms for cellular growth. Dissolved Organic Carbon (DOC) is a measure of the dissolved organic carbon present in a subsurface environment that may be used as a substrate by indigenous microorganisms for cellular growth.

Presence of Microorganisms: A laboratory microcosm study can be used to evaluate whether dechlorinating organisms are present. One of the EPA regions (Region 2) has issued guidance suggesting that the microcosm studies be utilized. However, a microcosm study can be costly and extremely time-consuming (typically a minimum of 24 weeks required). Perhaps more important, Earth Tech has also found that microcosm studies can provide equivocal results.

2.6.2 Site-Specific Natural Attenuation Considerations

As discussed above in Section 2.5, the site-specific COCs generally consist of chlorinated and petroleum VOCs. The attenuation capacity of these constituents varies significantly and the optimal geochemical conditions that support biodegradation also varies. Given the site-specific conditions and the chlorinated compound contamination, anaerobic degradation, or more specifically anaerobic reductive dehalogenation (otherwise known as dechlorination in the case of chlorinated compounds), is the most likely pathway for the natural attenuation of the COCs at the Site. The chlorinated COCs detected in Site soil and groundwater, i.e., PCE, TCE, 1,1-DCA, TCA, MC and VC, are all amenable to anaerobic degradation.

Anaerobic reductive dehalogenation results in the replacement of a halogen (e.g., chlorine) by a hydrogen molecule. An example of this process ("hydrogenalysis") is the case of TCE (three carbon-chlorine bonds) being degraded to *cis*-1,2-DCE (two carbon-chlorine bonds). This process proceeds sequentially until all chlorine atoms have been removed. Under this scenario, the chlorinated solvent acts as an "alternative" electron acceptor for anaerobic bacteria. It is called "alternative" because the common electron acceptors in groundwater include oxygen, nitrate, ferric iron, sulfate and carbon dioxide. Electron donors are typically either natural organic material present or other co-contaminants that can serve as primary substrates. Figure 23 shows the progression of biochemical reactions that occurs as electron acceptors are utilized and a contaminant plume matures. The reductive dehalogenation is carried out by electrons from the oxidation of the primary substrate (typically an organic carbon source or "electron donor"). These biochemical processes involve both reduction and oxidation processes. The extent to which both of these reactions are occurring is called the oxidation-reduction potential (ORP) or "redox" conditions. Figure 24 presents some of the important reactions that occur as contaminants biodegrade and the respective optimal redox conditions that will support the reactions.

Environmental transformation pathways for the site-specific COCs are illustrated in Figure 25. As depicted in Figure 25, important intermediate degradation products (daughter products or metabolites) include: cis-1,2 dichloroethene (cis-1,2 DCE; from TCE); VC (from cis-1,2 DCE); and, chloromethane (from MC). Important site specific end products include: chloride, carbon dioxide (CO_2), and ethene/ethane. Figure 25 also demonstrates the predominant biological mechanisms that facilitate the degradation which include: aerobic biodegradation; anaerobic biodegradation; aerobic cometabolism; and, anaerobic cometabolism. It is important to note that cis-1, 2 DCE is not a source contaminant and as such, is a key indicator that biodegradation is occurring. Increasing concentrations of cis-1,2 DCE are quite common as the source contaminants degrade and produce additional cis-1,2 DCE.

Similar to PCE and TCE, 1,1,2-TCA can be biodegraded anaerobically via reductive dehalogenation to 1,2-DCA. In turn, 1,2-DCA may be degraded to chloroethane and subsequently to VC by either biological ("biotic") or physical/chemical ("abiotic") processes. It may also be degraded to ethene via the elimination of two chlorine atoms (dihaloelimination), also by either biotic or abiotic means. Anaerobic bacteria reported to degrade 1,2-DCA by reductive dehalogenation under reducing conditions include methanogens and sulfate-reducing bacteria (Belay and Daniels, 1987; Egli et al., 1987). These anaerobes operate under mildly to strongly reducing conditions. Important daughter products of the COCs include: *cis*-1,2-DCE; 1,1 dichloroethane (DCA); chloroethane; chloromethane; chloride; vinyl chloride; and, 1,1 dichloroethene. Important end products of the COCs include: ethene; ethane; and, chloride.

The focus on the attenuation capacity of the chlorinated COCs is not intended to overlook the petroleum COCs. However, it is well documented that petroleum hydrocarbons biodegrade under a variety of redox conditions (aerobic and anaerobic) more easily and rapidly than most chlorinated VOCs. The focus on the chlorinated COCs is due to the fact that they are present at higher concentrations and because they do not attenuate as readily. Most petroleum hydrocarbons ultimately degrade to CO_2 and water. Therefore, some of the end products of biodegradation are common for petroleum and chlorinated VOCs.

2.6.3 Initial Data Evaluation

Upon becoming involved in this project, Earth Tech immediately evaluated the available COC, geochemical and natural attenuation data to generally assess the site-specific evidence that the COCs were attenuating. Leader initiated natural attenuation monitoring in 1997, although the attenuation monitoring parameters were somewhat limited and several key parameters were not monitored including ORP.

Using traditional purging/sampling techniques during previous sampling events, the dissolved oxygen (DO) of the aquifer had been measured at 5.0 to 7.3 mg/l. This data suggested that the aquifer was aerobic which would not support the anaerobic dechlorination necessary to support the degradation of the more recalcitrant chlorinated compounds. Upon reviewing the available data, it was apparent that despite total VOC concentrations exceeding 7,000 mg/l (initially), the contaminant plume had not migrated offsite during a period of over 13 years and the concentration of key chlorinated compounds had dropped rather dramatically.

2.6.4 Expanded Natural Attenuation Monitoring and Introduction of Low/Flow Purging and Sampling

After reviewing the background data for the Site, several changes to the routine sampling protocols were initiated, including expanding the analytical testing to include additional natural attenuation parameters and instituting low-flow purging and sampling techniques. These changes were instituted to better assess the potential for utilizing natural attenuation as a remedy for addressing groundwater impacts in lieu of pump and treat which was previously proposed by Eder and to a lesser degree by Leader.

Although a number of important laboratory parameters had been previously analyzed, several key parameters were added to support our suspicions that the natural attenuation capacity of the Site was very high. The expanded list of analytical laboratory parameters included: VOCs (Method 8260); total and dissolved iron and manganese; sulfide; alkalinity; dissolved organic carbon; dissolved gases (ethane, ethene, methane and carbon dioxide); and, several anions (chloride, nitrate, nitrite, sulfate, o-phosphate). Table 2 presents the expanded natural attenuation monitoring parameters and the respective field or laboratory method utilized.

Low-flow purging and sampling techniques were immediately employed to re-assess the geochemical conditions and confirm our suspicions that anaerobic conditions were actually prevailing. Low-flow purging and sampling techniques have now been employed for five consecutive quarterly sampling events.

3.0 DESCRIPTION OF HAZARDOUS WASTE MANAGEMENT UNITS TO BE CLOSED

This section describes both the Former Hazardous Waste Tank Farm and the Underground Cistern in terms of their operation in the past, configuration and types of wastes managed.

3.1 FORMER HAZARDOUS WASTE TANK FARM

The Former Hazardous Waste Tank Farm was utilized by HCC until January 1989 to store reclaimed and waste solvents in above ground steel storage tanks. A new tank farm was constructed adjacent to this area with a concrete containment area, which now constitutes the eastern edge of the Former Hazardous Waste Tank Farm. The storage tanks utilized in the former tank farm were relocated to the new tank farm once completed. The former tank farm is located at the northeast corner of the solvent process building and comprises an area of approximately 2,000 square feet. See Figure 2 for location. The southern and eastern sides of the area are bounded by 30-inch high concrete walls associated with the secondary containment systems for adjacent tank farms, while the northern side is bounded by an earthen dike, approximately 3 feet high. The western side is bounded by a sloped area of soil, approximately 2 feet high.

The base of the Former Hazardous Waste Tank Farm is comprised of gravel ranging in thickness from two to five feet. Alluvial till lies below the gravel, which results in ponding of the area during heavy rains. This area is dewatered by pumping accumulated water from a central collection sump located in the northeast corner of the area. This sump is believed to consist of a 12-inch diameter, gravel filled perforated clay tile pipe, approximately 3 feet long.

3.1.1 Hazardous Wastes Managed

The Former Hazardous Waste Tank Farm was utilized to store a number of F-listed hazardous waste solvents (F001-F005), discarded commercial chemical products, off-specification chemicals, container residues and spill residues (U002, U019, U031, U037, U052, U080, U112, U121, U140, U154, U159, U161, U213, U220, U226 and U239), as well as ink formulation wastes (K086) and characteristic hazardous wastes (D001).

3.1.2 Distinction Between HWMUs and SWMU

Although traditional RCRA Corrective Action terminology has not been utilized for previous reports, it is apparent that the discussion of "closure" in the context of corrective actions led to some confusion with regard to previous Closure Plan submittals to the OEPA. The regulated HWMU's must be formally closed pursuant to applicable regulations, but the closure of these regulated units has always been considered a component of the corrective actions that are necessary to complete the closure process. Corrective actions can be necessary as part of the closure of regulated units, but may also be required as a component of an approved Part B Permit (e.g. the RCRA Corrective Action process) for SWMU's not subject to formal closure requirements. The site-specific circumstances necessitate that corrective actions are conducted as part of the closure process, but also to address overall RCRA Corrective Action requirements specified in the approved Part B Permit.

This Closure Plan addresses closure and corrective actions that are proposed to address the regulated HWMUs. The attached RCRA Corrective Measures Implementation Plan (CMI Plan) proposes natural attenuation as a site-wide remedy to address groundwater impacts and future capping to address soil impacts at the solvent tank farm SWMU. Rather than duplicate the corrective action discussion entirely, the corrective actions proposed as part of the closure process are also discussed in more detail in the CMI Plan because the proposed corrective actions are the same for meeting both requirements.

3.2 UNDERGROUND CISTERN

The Underground Cistern was installed in 1975 and operated until 1982. The tank was taken out of service in 1993 by removing all wastes and backfilling the structure. The cistern is an oval-shaped tank, approximately 5 feet in height, by 9 feet long by 6 feet wide, fitted with a two piece concrete cover. The cistern is located to the east of the HCC facility building and east of the Former Hazardous Waste Tank Farm. See Figure 3 for location. Access to the cistern was by two 24-inch diameter manways, extending roughly 8 feet to grade, where they were covered by a steel plate. This plate was replaced with an 8-inch thick concrete pad in 1993 during decommissioning activities. A four-inch diameter inlet pipe was located approximately 4 feet from the bottom of the tank.

The cistern was used as a secondary containment system for facility floor drains and trenches.

3.2.1 Hazardous Wastes Managed

The Underground Cistern could potentially have contained a number of F-listed hazardous waste solvents (F001-F005), discarded commercial chemical products, off-specification chemicals, container residues and spill residues (U002, U019, U031, U037, U052, U080, U112, U121, U140, U154, U159, U161, U213, U220, U226 and U239) as well as ink formulation wastes (K086) and characteristic hazardous wastes (D001). These wastes are consistent with the wastes previously stored in the Former Hazardous Waste Tank Farm.

3.2.2 Previously Completed Closure Activities

HCC completed the field activities associated with closure of the Underground Cistern on April 13, 1993, in accordance with the 1985 Eder "Closure Plan for Underground Cistern" and the 1991 "Closure Plan for Solvent Tank Farm and Underground Cistern, Revision No. 1". Closure involved: pressure washing the interior of the cistern; removing and disposing of all liquids from the cistern; and, filling the cistern, drains leading into the cistern and associated manways with concrete/grout to prohibit future use. ~~Actions necessary to formally complete the closure process at the former underground cistern are discussed below.~~ NO FURTHER CONSTRUCTION RELATED CLOSURE ACTIVITIES ARE PROPOSED FOR THE UNDERGROUND CISTERN, HOWEVER, POST-CLOSURE GROUNDWATER MONITORING AND MAINTENANCE ACTIVITIES RELATED TO THE UNIT ARE PROPOSED AND ADDRESSED IN MORE DETAIL IN SECTIONS 4.1 AND 11.0 OF THIS REVISED CLOSURE PLAN.

4.0 APPROACH TO CLOSURE

This section describes the approach to closure proposed for the Former Hazardous Waste Tank Farm and PROVIDES A SUMMARY OF CLOSURE ACTIVITIES PREVIOUSLY COMPLETED FOR THE Underground Cistern, including soils management, groundwater management, capping of the L-shaped area and presents a cost estimate for closure.

4.1 PREVIOUSLY COMPLETED CLOSURE ACTIVITIES – FORMER UNDERGROUND CISTERN

This section describes the approach to closure of the Underground Cistern, including past activities associated with soils management, groundwater management and Closure Certification. HCC completed the field activities associated with closure of the Underground Cistern on April 13, 1993, in accordance with the 1985 Eder "Closure Plan for Underground Cistern" and the 1991 "Closure Plan for Solvent Tank Farm and Underground Cistern, Revision No. 1". The OEPA was notified of the closure activities in advance. A letter certifying the closure activities was submitted to the OEPA on April 28, 1993. A copy of the letter is presented in Appendix C. Closure involved: pressure washing the interior of the cistern; removing and disposing of all liquids from the cistern; and, filling the cistern, drains leading into the cistern and associated manways with concrete/grout to prohibit future use. Soil and groundwater investigation activities conducted prior to closure are summarized in Sections 4.1.2 and 4.1.3 of this Closure Plan.

4.1.1 General Approach

The Closure Performance Standard as specified in OAC 3745-55-11 states that the owner or operator minimize the need for further maintenance, control, and minimize or eliminate threats to human health or the environment. Given that the cistern was cleaned and filled with concrete/grout, this will prohibit future use of the unit. Direct contact with impacted sub-soils, while possible, would only occur if the surrounding soil is excavated. The closure of the cistern has minimized threats to human health and the environment. Impacted groundwater will be addressed through the RCRA post-closure groundwater monitoring program for the Underground Cistern/corrective action process groundwater monitoring program associated with the solvent storage tank farm SWMU as discussed in Section 4.1.3 of this Closure Plan.

4.1.2 Soils

Previous site investigation activities were conducted as part of the initial and follow-up site activities as outlined in the Site Investigation Report (Eder-April 1987) and Site Investigation Report - Addendum No. 1 (Eder-August 1988). Figure 8 presents the location of soil borings and area exhibiting elevated COC concentrations in the vicinity of the former underground cistern. A total of six soil borings were advanced in the immediate vicinity of the cistern, with a total of nineteen samples analyzed for total VOCs. Concentrations ranged from 11.8 mg/Kg to 6,700 mg/Kg, decreasing with depth. No additional investigations are believed to be necessary. Closure requirements specified in OAC 3745-55-97 state that tank system owners or operators shall remove or decontaminate waste residues, containment system components, contaminated soils, structures and equipment as part of the closure. As contaminated soils

were not removed or decontaminated, and are not proposed to be removed, the tank system must be closed in accordance with the landfill requirements specified in OAC 3745-57-10, which is the basis for the closure as proposed.

4.1.3 Groundwater

A natural attenuation remedy is proposed to address site-wide groundwater impacts on a global basis. Additional details are provided below in Section 4.2.3.

4.1.4 Closure Cost Estimate

A closure cost estimate has not been provided as the Underground Cistern has been closed. Post-Closure care costs, which include post-closure groundwater monitoring costs related to the Site in general, are addressed in Section 4.2.8 of this Closure Plan.

4.2 FORMER HAZARDOUS WASTE TANK FARM

~~4.1.1~~4.2.1 General Approach

HCC intends to construct an alternative landfill capping system over the existing Hazardous Waste Tank Farm. Initial site grading and preparation work will be conducted based on an April 2000 site survey. This will result in a minimum 12-inch thick aggregate fill layer (comprised of existing ODOT #57 and minor amounts of ODOT #4, from regrading activities), which will serve to support the cap. The aggregate will be compacted. The concrete cap, WHICH WILL BE ENHANCED WITH IPANEX TO REDUCE THE PERMEABILITY, INCREASE THE DURABILITY AND INCREASE THE CORROSION RESISTANCE OF THE CONCRETE, will then be constructed on top of the aggregate fill, followed by application of an impermeable coating for protection of the concrete. HCC intends to utilize this area for non-regulated product storage.

The Closure Performance Standard as specified in OAC 3745-55-11 states that the owner or operator minimize the need for further maintenance, control, and minimize or eliminate threats to human health or the environment. Maintenance of the cover system will be minimized, as the concrete itself is very durable, unlike a soil cover system, which is subject to erosion. Given that the concrete cap will prohibit direct contact with impacted sub-soils and eliminate infiltration impacts to groundwater, the alternative capping system as proposed in this Closure Plan will control, minimize or eliminate threats to human health and the environment. The proposed closure of the Former Hazardous Waste Tank Farm will minimize threats to human health and the environment.

4.2.2 Soils

Previous site investigation activities were conducted as part of the initial and follow-up site activities as outlined in the Site Investigation Report (Eder-April 1987) and Site Investigation Report - Addendum No. 1 (Eder-August 1988). Figure 8 presents the location of soil borings and area exhibiting elevated COC

concentrations in the vicinity of the Tank Farm. Concentrations ranged from 0.789 mg/kg to 991 mg/kg, generally increasing with depth. No additional investigations are believed to be necessary. Closure requirements specified in OAC 3745-55-97 state that tank system owners or operators shall remove or decontaminate waste residues, containment system components, contaminated soils, structures and equipment as part of the closure. As contaminated soils were not removed or decontaminated, and are not proposed to be removed, the tank system must be closed in accordance with the landfill requirements specified in OAC 3745-57-10, which is the basis for the closure as proposed.

4.2.3 Groundwater

Impacted groundwater will be addressed using a monitored natural attenuation approach, which will include a post-closure groundwater monitoring program. ALL GROUNDWATER MONITORING WILL BE CONDUCTED IN ACCORDANCE WITH OAC 3745-54-90 THROUGH 10099, 3745-55-01, and 3745-55-011., AND 3745-55-02.

4.2.3.1 Natural Attenuation Assessment

As discussed above, three lines of evidence can be utilized to assess the natural attenuation capacity of a site. These lines of evidence include: stable or decreasing concentrations; suitable biogeochemical conditions; and, the presence of sufficient microorganisms. Each of these lines of evidence is discussed below in consideration of the site-specific data/conditions.

Stable or Decreasing Concentrations: Figure 13 is a Total VOC Isoconcentration Map showing total VOC concentrations in groundwater in April 1988. Figure 17 is a Total VOC Isoconcentration Maps showing total VOC concentrations in groundwater in March 2000. A comparison of these figures demonstrates that the aerial extent of the VOC plume has essentially stabilized. The total VOC concentration has decreased from over 7,000 mg/l to less than 200 mg/l over a period of 15 years in which monitoring has been conducted.

Well C has historically and continues to contain the highest concentration of COCs. Figure 18 is a graph showing the Total VOC concentrations in well C since it was installed in 1986. Well SW-3 is located directly downgradient of well C and has also exhibited a decreasing concentration trend as presented on Figure 19. As presented in these figures and table, the VOC concentrations have dropped dramatically and there have been negligible detections of VOCs in downgradient monitoring wells.

Methylene Chloride has been, and remains, the COC present at the highest concentration. It has dropped from a historic high of 7,400 mg/l in well C to as low as 30.3 mg/l in well C during the November 1997 sampling event. More recently, the concentration has been at 230.13 mg/l. Figure 21 is a graph showing the Methylene Chloride concentration in well C since it was installed in 1986. The methylene chloride concentration has decreased by approximately 86% in well C since 1986 solely as a result of natural attenuation processes. Well SW-4 is also downgradient of the primary source area and has exhibited a decreasing Methylene Chloride concentration trend as depicted on Figure 22.

Biogeochemical Conditions Indicative of Biodegradation

***Geochemical Factors*:** Geochemical factors, e.g., pH, ORP, DO, alkalinity (an estimate of the CO_2 that is produced during nitrate reduction), and temperature define subsurface environmental conditions that affect the extent of in situ biodegradation processes. The DO (0.28 to 1.21 mg/l) and ORP (46.5 to -113.3 millivolts) in the most impacted wells are generally within the optimal range to support reductive dechlorination. The pH and temperature are within a range that will support anaerobic biodegradation. The alkalinity is distinctly elevated in the more contaminated areas of the Site suggesting the production of CO_2 as a by-product of biodegradation.

The field parameters obtained from the Site groundwater, including ORP and DO, demonstrate that the groundwater is generally reducing and anaerobic and within the range required for microbial degradation of chlorinated solvents. ORP and DO values are lowest in the more contaminated part of the Site where VOC concentrations are the highest as presented in Figures 26, 27 and 28 representing data from the February 1999 and March 2000 sampling events.

The alkalinity (as CaCO3) concentrations correspond to CO2 concentrations across the Site. The general levels of alkalinity at the Site indicate a medium buffering capacity of the geochemical makeup of the groundwater.

***TEAPs*:** Important TEAPs include: sulfate; manganese; ferric iron (Fe^{+3}); CO_2 (which is also an end product); and, nitrate. These TEAPs were measured in sufficient concentrations to support the continued anaerobic degradation of source constituents. The groundwater condition is generally nitrate-, iron-, and manganese-reducing. A nitrate-, iron- and manganese-reducing environment is highly conducive to reductive dechlorination as nitrate, ferric iron, and manganese($^{+4}$) act as TEAPs for microbial respiration in the absence of oxygen.

Nitrate was generally observed at low concentrations ranging from below the laboratory reporting limit to 1.4 mg/l. The low levels of detected nitrate in the groundwater indicate that nitrate-reducing bacteria are likely active in groundwater at the Site. The occurring nitrate reduction is also consistent with the measured ORP values as depicted in Figures 26 and 27. In general, an inverse relationship between contaminant concentrations and nitrate can be expected and is encountered as depicted in Figure 29. The presence of detected nitrate in well F, which is an upgradient well, confirms that the nitrate will continue to be replenished to support nitrate reduction and to supply nitrogen as a nutrient.

The use of ferric iron (Fe^{+3}) as a TEAP by microorganisms yields dissolved, ferrous iron (Fe^{+2}). Wells with the highest concentration of ferrous iron (Fe^{+2}) correspond with the wells containing the highest VOC concentration (Figure 30) which is indicative of the consumption of Fe^{+3} during the degradation process (and corresponding generation of Fe^{+2}). Dissolved iron concentrations varied from non-detect to 118 mg/l.

The use of oxidized manganese (Mn^{+4}) as a TEAP by microorganisms yields reduced dissolved manganese (Mn^{+2}). Dissolved manganese concentrations range from non-detect to 5.6 mg/l. Overall, a positive correlation between contaminant concentrations and Mn^{+2} concentration over time can be expected. Figure

31 shows that the wells with elevated manganese concentrations correspond with the wells containing the highest VOC concentration, as expected.

Under more strongly reducing conditions (generally defined by a negative ORP value), sulfate may be used as a TEAP during anaerobic biodegradation. Under sulfate-reducing conditions, sulfate demand (by sulfate-reducing microorganisms) is expected to be high, and sulfate concentrations may be depleted in the area of the plume. Observed sulfate concentrations range from 80.2 mg/l to 1,080 mg/l. Figure 32 shows that there is a slight correlation between wells with a lower sulfate concentration and the wells containing the highest VOC concentration.

Although CO_2 can be consumed during methanogenisis, an elevated CO_2 concentration was noted suggesting a mature (stable) plume. This also suggests that nitrate reduction is a more important site-specific factor because CO_2 is produced as a by-product of nitrate reduction. Carbon dioxide was detected in significant concentrations (up to 774mg/l) in the impacted groundwater. In contrast to its low concentrations in the much less-impacted wells, the levels of CO_2 may be attributed to microbial respiration due to VOC degradation in groundwater. Although all wells were not analyzed for dissolved CO_2, Figure 33 shows that the wells with elevated CO_2 concentrations correspond with the wells containing the highest VOC concentration, as expected. The detection and levels of CO_2 also correspond to those of methane, a clear indication of microbial anaerobic respiration.

Methane (CH_4) is an indicator of anaerobic conditions and of methanogenic bacteria. It is produced from the microbial reduction of carbon dioxide that often take place in anaerobic and reducing environments. Methane was detected in groundwater samples at concentrations ranging from non-detect to 6.9 mg/l. Methane is extremely volatile and any dissolved constituent will partition to the gaseous phase when coming into contact with air. The presence of methane may be indicative of methanogenic processes. Although all wells were not analyzed for dissolved ~~CO_2~~METHANE, Figure 34 shows that the wells with elevated methane concentrations correspond with the wells containing the highest VOC concentration, as expected.

Daughter Products/Metabolites: Of all the biogeochemical data, perhaps the most obvious indicators of reductive dechlorination are the presence of the sequential daughter products of chlorinated solvent degradation. Important daughter products of the COCs include: *cis*-1, 2-DCE; 1,1 dichloroethane (DCA); chloroethane; chloromethane; chloride; VC; and, 1,1 dichloroethene. The detection of dissolved chloroethane and VC, compounds that are generally in gaseous phase, are clear indications of their generation as daughter products of the biodegradation processes. Commercial DCE is manufactured principally as the *trans* isomer, therefore a high *cis/trans* ratio in the environment indicates biological transformation of PCE/TCE.

Increasing trends in the concentration of *cis*-1,2-DCE was noted in wells A, B, G and SW-4 (Figures 35, 36, 37 and 38). Increasing trends in the concentration of chloroethane and 1,1 DCA were also noted in wells G and SW-4 (Figures 37 and 38). The high concentrations of COCs and resultant high laboratory limit of quantitation (LOQ) likely precludes the detection of some daughter products in well C.

The absence of VC in most of the monitoring wells and variability in concentrations may be attributed to the fact that the transformation from *cis*-1, 2-DCE to VC is likely to be the slowest step within the reductive dehalogenation pathway of TCE (RTDF, 1998). Therefore, any VC produced will not accumulate, but will readily degrade to either CO_2 and H_2O or ethene.

End Products: Chloride, ethane and ethene are metabolic end products of reductive dehalogenation of halogenated ethanes and ethenes. The high concentrations of COCs and resultant high laboratory limit of quantitation (LOQ) likely precludes the detection of some end products. Ethane (C_2H_6) and/or ethene (C_2H_4) were detected in four of the five monitoring wells that were analyzed. The upgradient well (Well I) was the only well that did not contain ethane and/or ethene. The transformation of these compounds to $CO_{2\ may}$ be very rapid; therefore they may not accumulate in high concentrations in the groundwater.

Groundwater impacted with chlorinated compounds often has elevated chloride concentrations as a result of anaerobic dechlorination. The highest concentrations should occur in the more highly contaminated areas of the Site. The wells outside of the contaminated zones should show significantly lower levels of chloride. Chloride was detected in all of monitoring wells sampled except for well B. The highest chloride concentrations were generally found in wells with historically higher concentrations of chlorinated compounds as presented on Figures 39 and 40. The chloride concentration ranged from non-detect to 975 mg/l. Groundwater in less-contaminated monitoring wells shows significantly lower chloride concentrations than those with higher VOC concentrations. Therefore, there appears to be a positive correlation between chlorinated VOC and chloride concentrations.

***Presence of Microorganisms*:** The microbial community was assessed and enumerated prior to becoming involved in the project. The highest counts of anaerobic bacteria coincided with the wells exhibiting the highest concentrations of COCs. Therefore, a more significant evaluation of the microbial community (microcosm study) was not considered necessary given the significance of the other lines of evidence. In addition, as discussed above in Section 2.6.1, microcosm studies can be costly and extremely time-consuming and may provide equivocal results.

***Nutrients*:** Ammonia-nitrogen, phosphates and nitrate (which is also a TEAP) are nutrients required by microorganisms for cellular growth. The presence of nitrate generally indicates that a source of nutrients is available for microbial metabolism. Although nitrate concentrations are reduced in source wells due to nitrate reduction, the nitrate concentrations are adequate to support biodegradation. Phosphate concentrations at the Site as represented by total phosphorus ranged from non-detect to 0.89 mg/l. All wells except one contained some level of total phosphorus. The total phosphorus levels are not considered optimal to support biodegradation. However, in most cases microbial growth may still occur under these conditions. In these instances phosphate is being consumed, in microbial metabolic processes, at the same rate that phosphate is produced in the subsurface or introduced by influx of groundwater. Sources of phosphate in the subsurface include: dissolution of minerals (e.g., apatite, strengite) containing phosphate, and the decay of cellular matter (e.g., bacteria, protozoa, nematodes, etc.) that contains phosphorous which is subsequently converted to phosphate through geochemical reactions. Apparently, low groundwater concentrations of phosphorus, therefore, do not necessarily constitute a nutrient limitation.

Substrate: DOC is a measure of the dissolved organic carbon present in a subsurface environment that may be used as a substrate by indigenous microorganisms for cellular growth. DOC was detected in all of the groundwater samples that were analyzed for DOC at a concentration ranging from 2.4 mg/l to 27.8 mg/l. The detection of organic carbon in the dissolved phase may indicate a sufficient presence of organic material adsorbed onto the aquifer soil matrix and available for microbial growth.

Summary: In summary, the site-specific biogeochemical parameter data provide evidence that the subsurface environment in the groundwater at the Site supports and promotes natural attenuation of the COCs.

4.2.3.2 Monitored Natural Attenuation Groundwater Remedy

As presented above, natural attenuation processes have resulted in decreasing concentrations and the COC plume has stabilized. The natural attenuation assessment revealed anaerobic conditions within the aquifer, sufficient nutrients and TEAPs, and key evidence of end (degradation) products. Therefore, Natural Attenuation is proposed as a site-wide remedy for addressing impacted groundwater.

Given that impacted soil will not be removed from the Site or treated and that a passive groundwater remedy (natural attenuation) is proposed, a Contingency Plan consisting of an alternative groundwater remedy was developed and is presented in Section 5.0 below. The Contingency Plan proposes a series of miletones or triggers that must be reached prior to activating the Contingency Plan. The Contingency Plan is also established in stages based on the significance of the "trigger". The triggers are based on the COC concentrations encountered in downgradient monitoring wells. Prior to initiating the Contingency Plan, a confirmatory sampling event will be initiated immediately upon encountering the trigger concentration. If the trigger concentration persists, the Contingency Plan will be activated in stages, as defined below. If the trigger concentration is unconfirmed during the confirmatory sampling event, routine monitoring will be reinstated.

4.2.4 Groundwater Monitoring Plan

Groundwater monitoring is an integral component of the selected groundwater remedy as well as a required component of post-closure care. ALL GROUNDWATER MONITORING WILL BE CONDUCTED IN ACCORDANCE WITH OAC 3745-54-90 THROUGH 10099, 3745-55-01, and 3745-55-011., ~~AND 3745-55-02~~. The site-specific Quality Assurance Project Plan (QAPjP) outlines data quality objectives (DQOs) and sets quality acceptance criteria for data generated to meet the DQOs. The QAPjP is presented in Appendix D.

This Groundwater Monitoring Plan (GMP) should be utilized in conjunction with the QAPjP to ensure that data quality objectives are reached and that the selected groundwater remedy is addressing the groundwater impacts sufficiently. The DQOs for this project are: to monitor the progress of natural attenuation processes; to confirm that the attenuation capacity of the aquifer is sufficient to be protective of human health and the environment; and, to identify constituent concentrations that would trigger implementation of the Contingency Plan. This GMP provides a general discussion regarding the procedures to be used, but

primarily focuses on the frequency and duration of groundwater monitoring and sampling events. Monitoring and sampling frequencies have been selected to detect triggers in a reasonable timeframe while also considering economic factors.

At the completion of all ground water monitoring activities and prior to closure certification, monitoring wells will be properly plugged and abandoned. This activity will take place upon the completion of the monitored natural attenuation. The closure /abandonment of the well will be done in accordance to the methodology described in Chapter 9 of the Ohio EPA's, Technical Guidance Manual for Hydrogeologic Investigations and Ground Water Monitoring (Feb. 1995) or the Ohio EPA approved Manual at the time of closure/ abandonment.

4.2.4.1 Groundwater Level Measurements

Groundwater level measurements will be made on a monthly basis, through the completion of the proposed capping at the former Hazardous Waste Tank Farm HWMU (L-shaped area) and for a period of three months following the capping. Groundwater level measurements will also be made prior to all sampling events through the post-closure care period (30 years following closure).

Groundwater levels will be measured using an electronic water level indicator. Water levels will be measured to the nearest $\pm$ 0.01 foot from a surveyed datum on the top of the inner well casing. The groundwater elevation will be calculated by subtracting the depth measurement from the surveyed datum elevation. Water level measurements will be recorded on a Water Elevation form. The water level indicator tape and probe will be decontaminated between uses according to prescribed procedures.

4.2.4.2 Groundwater Sampling and Analysis

All monitoring wells (except well SW-1) will be sampled on a quarterly basis for a period of one-year following approval of this Closure Plan. Upon completing one-year of additional quarterly sampling, the frequency for sampling all monitoring wells will be reduced to ~~an annual~~ A SEMIANNUAL basis THROUGHOUT THE PERIOD REQUIRED FOR POST-CLOSURE MONITORING (29 YEARS OF SEMI-ANNUAL SAMPLING ONLY). HOWEVER, AS ACKNOWLEDGED IN THE MARCH 26, 2001 OEPA LETTER AND DISCUSSED DURING AN APRIL 11, 2001 TELEPHONE CONVERSATION BETWEEN EARTH TECH AND THE OEPA, THE SEMI-ANNUAL SAMPLING FREQUENCY MAY BE REDUCED BASED ON MONITORING RESULTS. THEREFORE, HCC PLANS TO RE-EVALUATE THE SAMPLING FREQUENCY ON AN ANNUAL BASIS AND WILL PETITION THE OEPA TO ADJUST THE FREQUENCY, AS WARRANTED.~~Select monitoring wells will continue to be sampled on a quarterly basis for a period of four years following the initial year of monitoring. The select wells include: well I; well C; well SW-2 and well SW-3. These wells were selected based on their location and importance relative to the contingency triggers discussed in Section 5.0. Well I is the most upgradient well and will be sampled to confirm that COCs are not migrating onto the Site from upgradient properties. Well C has historically contained the highest concentration of COCs and as such, it is anticipated that the COCs will persist in this well for the longest period of time. Wells SW-2 and SW-3 are located downgradient of the primary source area and represent the concentration of COCs that could be~~

~~migrating off site. These wells will be the primary wells that will activate the Contingency Plan triggers as discussed in more detail in Section 5.0. Upon completing the four years of quarterly sampling in the select wells discussed above, continued groundwater sampling will be limited to annual sampling in all monitoring wells throughout the period required for post-closure monitoring (30 years total, 25 years of annual sampling only).~~ In the event a Contingency Plan trigger is activated, the frequency and wells to be sampled will be adjusted as approved on a case by case basis by the OEPA.

The groundwater sampling procedure utilized during post-closure/corrective action monitoring will consist of well purging, measurement of field parameters, completion of well purging and sample collection forms, and collection of groundwater samples for laboratory analysis. The field parameters will include:

- Temperature
- pH
- Dissolved Oxygen
- Specific Conductivity
- Turbidity
- Oxidation-Reduction Potential
- Ferrous Iron

To minimize sample turbidity and collect representative samples, low-flow purging of the wells will be conducted using a low-flow adjustable rate pump. With the exception of ferrous iron, the above-referenced field parameters will be monitored during the well purging process to determine if purging has been adequately completed. Low flow purging and sampling procedures will be consistent with the procedures implemented by Earth Tech during 1999 and presented in RCRA Monthly Progress Report No. 2 (Earth Tech 1999) submitted to the OEPA on March 1, 1999. The Low-flow purging techniques will be conducted as outlined in EPA guidance document entitled, "Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures," (US EPA April 1996). THIS REFERENCE IS PRESENTED IN APPENDIX N.

The analytical parameters and methods will also be consistent with the recent monitoring events and as outlined in the QAPjP and presented on Table 3.

4.2.4.3 Groundwater Monitoring Reports

Groundwater Monitoring Reports will be prepared and submitted to the OEPA following each sampling event. The Groundwater Monitoring Reports will include: a statistical evaluation including a trigger assessment; a Groundwater Contour Map; and, a discussion regarding the geochemical conditions and natural attenuation parameters. All data associated with the ground water monitoring program will be submitted annually in a ground water monitoring report in compliance with OAC Rule 3745-54-75 and 3754-97 (J). The annual ground water monitoring report shall include the appropriate data in the electronic format as outlined in the Supplementary Annual Report form supplied by the Director. The annual report will be submitted to Ohio EPA by March 1 of each year.

In addition to the submission of the Supplementary Annual Report form, Rule 3745-01(G) requires the facility to semiannually submit reports on the effectiveness of the corrective action program. HCC will submit Semiannual reports on the effectiveness of the corrective action program once the data from the semiannual events is evaluated.

4.2.5 Residual Soil Management

Based upon a topographic survey of the former Hazardous Waste Tank Farm area conducted on April 5 and 6, 2000, it was determined that approximately 25 cubic yards of berm materials surrounding the area to be capped will need to be relocated in order to construct the cap at an elevation approximately two feet higher than the adjacent tank farm concrete pad. Additional soil will also have to be relocated to accommodate the installation of the sub-surface drainage system (estimated to be less than 15 cubic yards). These materials will be placed under the capped area, below the aggregate fill. ANY SOILS THAT REQUIRE REMOVAL WITHIN THE AREA TO BE CAPPED WILL NOT BE PLACED OUTSIDE THE LIMIT OF THE CAP OTHER THAN IN TEMPORARY STORAGE CONTAINERS.

4.2.6 Capping

HCC intends to construct an engineered alternative concrete cap over the area of the Former Hazardous Waste Tank Farm. The L-shaped area was previously identified in the June 1998 Closure Plan prepared by Leader Environmental, Inc. as comprising 1,200 square feet. HCC intends to cap a ~~3,600~~ 3,350 square foot area as identified on Figure S-1 in Appendix E and on Figure 41.

The area identified for capping will be regraded to produce a level surface at an elevation of 980.30 feet msl. A total thickness of at least 12 inches of aggregate, berm soils and soils generated from the drainage system installation will be placed and compacted within the area to be capped. The soil will be staged in roll-off boxes or SIMILAR STORAGE CONTAINERS PRIOR TO PLACEMENT IN THE AREA TO BE CAPPED. NO SOILS REMOVED WITHIN THE AREA TO BE CAPPED WILL BE DISPOSED OF OUTSIDE THIS AREA. ~~On and under 10 mil plastic sheeting~~. As an initial step to capping, the existing aggregate will be scraped from the surface and staged within the area to be capped. Once a level surface is obtained, the existing aggregate will be placed and compacted over the area to be capped. A grain size analysis of the existing material is provided in Appendix I for verification that the material meets the ODOT #57 classification specified. The aggregate is estimated to have a permeability of $1x10^{-2}$ cm/sec. and will be compacted using a smooth drum roller, a minimum of four passes, with each successive pass in opposing directions. The percentage of fines in the aggregate is negligible. The aggregate will provide both structural support for the concrete cap and allow for frost heave protection. Should the underlying soils beneath the capped area be exposed during the excavation/grading process, they will be compacted to a minimum of 90% of the optimum density as determined by the Standard Proctor test (ASTM Method D-698). A minimum of one test will be performed for existing materials underlying the capped area and one for materials being relocated under the cap. These analyses will be utilized during placement of the soil in the area to be capped and to document soil conditions under the cap. Nuclear density testing per ASTM Method D-2922 will be performed during placement of the materials being

relocated at a minimum of 4 locations. In addition, existing soils, if exposed during regrading activities, will be tested at 5 locations. Tests shall be performed at depths of 6 and 12 inches.

The concrete pad will consist of 4,000 psi reinforced concrete, 12 inches thick. THE CONCRETE WILL BE ENHANCED WITH IPANEX, A CONCRETE ADDITIVE, THAT WILL SERVE TO PRODUCE A LESS PERMEABLE, MORE DURABLE AND MORE CORROSION RESISTANT MIX. The reinforcement will comply with American Society for Testing Materials (ASTM) A615, Grade 60 minimum standards. The concrete base will be sloped to drain toward a 1-foot square sump, located in the northwest corner of the proposed concrete pad. The pad will be constructed using continuous pours not to exceed 60 feet in wall or slab length. EXPANSION/CONTRACTION JOINTS WILL BE PLACED ON 20-FOOT CENTERS OVER THE SURFACE OF THE PAD. THE JOINTS WILL ALSO BE CARRIED UP THE SIDEWALLS OF THE CONTAINMENT AREA TO COINCIDE WITH THOSE ON THE FLOOR. AN ADDITIONAL EXPANSION/CONTRACTION JOINT WILL BE LOCATED ALONG THE NORTHERN WALL OF THE CONTAINMENT AREA. THE REVISED DRAWINGS S-1 AND S-2 SHOW THE LOCATIONS OF THE EXPANSION/CONTRACTION JOINTS, DEPTH OF THESE JOINTS AS WELL AS WATER STOPS AND CAULKING/SEALANT PROPOSED FOR USE IN THESE JOINTS. All joints will have A POLYETYHLENE EXPANSION BOARD INSERTED, A SERIES OF TWO WATERSTOPS, WITH THE EXPANSION BOARD TOPPED WITH A CHEMICALLY RESISTANT CAP to provide a secondary means of containment. New sidewalls integral to the pad will be 36-inches in height, by one foot wide. Existing concrete surfaces will be ~~roughened and~~ JOINED TO THE OLD CONCRETE SURFACE ALONG THE INTERFACE UTILIZING A JOINT SEALANT bonding compound (AS NOTED ON DRAWING S-2) ~~applied~~ to maximize adhesion of the existing concrete surface to the new concrete surface AND TO PROHIBIT WATER INFILTRATION BETWEEN THE WALLS. MANUFACTURER'S LITERATURE FOR SEVERAL POTENTIAL BRANDS OF CAULKING/SEALANT ARE PROVIDED IN APPENDIX G. ~~In addition, a waterstop will be added at this surface.~~ Three specimens of the concrete will be collected during placement using ASTM Method C-31. Cylinders will be broken following a 28-day cure using ASTM Method C-39, to verify the required compressive strength is met.

Once the concrete cures, a protective coating will be applied to maximize the integrity of the concrete. A ~~The~~ Railine coating (Siloxirane 2032, by Advanced Polymer Coatings) ~~will be utilized~~ WAS APPLIED OVER THE CURRENT HAZARDOUS WASTE TANK FARM CONCRETE as this material was approved by OEPA for application ~~over the current hazardous waste tank farm concrete~~. A coating (CHEMLINE 784/32 ~~Railine, Siloxirane 2032~~, 20 ~~30~~ mils thick) will be applied to the floor and walls. THE RAILINE COATING SILOXIRANE 2032 IS NO LONGER MANUFACTURED AND HAS BEEN REPLACED BY THE CHEMLINE PRODUCT. THIS NEW PRODUCT IS FAR SUPERIOR TO THE OLD, IN THAT IT IS MUCH STRONGER AND PROVIDES SUPERIOR CHEMICAL RESISTANCE TO THAT OF THE SILOXIRANE 2032 PRODUCT. This will provide chemical resistance to solvents (HCC intends to utilize this area as a new solvent storage tank farm as discussed further below) and corrosion resistance as well as added durability for the surfaces. ~~See Appendix F for manufacturer's literature on the Railine coating.~~

THE NEW PRODUCT HAS A VERY DENSE STRUCTURAL CONFIGURATION OF 28 FUNCTIONAL GROUPS PER MOLECULE, WHICH RESULTS IN A STRUCTURE WHEN POLYMERIZED OF 784 CROSS-LINKS. THE SILOXIRANE 2032 HAD 25 CROSS-LINKS. HUKILL WILL INSTALL A PRIMER (CHEMPRIME 403) FOLLOWED BY A DOUBLE APPLICATION OF 784/32 TO RESULT IN A TOTAL COATING AS CURED THICKNESS OF APPROXIMATELY 20 MILS. THE PRIMER WILL SEAL THE CONCRETE SURFACE AND ACTUALLY STRENGTHEN THE CONCRETE. MANUFACTURER'S LITERATURE FOR THESE PRODUCTS IS PROVIDED IN APPENDIX F OF THIS REVISED CLOSURE PLAN. ADVANCED POLYMER COATINGS, THE MANUFACTURER OF CHEMLINE 784/32 WILL PROVIDE A 5-YEAR GUARANTEE ON THE COATING PROVIDED ONE OF THEIR CERTIFIED INSTALLERS APPLIES THE COATING. HCC INTENDS TO HAVE A CERTIFIED INSTALLER APPLY THE COATING.

In addition to the fact that concrete has a permeability on the order of $1X10^{-9}$ cm/sec. with the incorporation of the IPANEX admixture as noted in the reference materials included in Appendix G, the ~~Railine~~ CHEMLINE coating proposed will further ensure an impermeable surface. The sloped surface of the proposed concrete pad will also reduce the contact time of any liquids within the tank farm.

Once the concrete cap is constructed and allowed to cure, HCC will install up to eight 19,800 gallon storage tanks, 12 feet in diameter and one 15,000 gallon tank, eight feet in diameter for storage of miscellaneous liquids, including solvents. In the event that hazardous waste will be stored in these tanks, HCC will prepare permit modifications, as required. HCC intends to construct the alternative cap for the former hazardous waste tank farm upon approval of the Closure Plan. Tanks will be installed appropriate for business requirements.

The concrete will be designed to support the loads as anticipated from the worst-case tank configuration as shown on Drawing S-1 in Appendix E. Design calculations, provided in Appendix H, assume a minimum bearing capacity of 2,000 pounds per square foot (psf) for underlying soils and subbase materials BASED UPON CALCULATIONS DERIVED FROM SOIL BORING LOGS FROM BORINGS CONDUCTED IN THE VICINITY OF THE AREA. Calculations indicate that each of the 12-foot diameter tanks will generate a total loading on the order of 1,~~2~~570 psf, WHICH INCLUDES THE WEIGHT OF THE CONCRETE. Calculations indicate that the octagon-shaped concrete pad, as designed, will easily be capable of withstanding the applied loads with an acceptable factor of safety. It should be noted that the octagon-shaped pad is also supported by the main concrete pad (cap over the tank farm). Frost heave is not accounted for in the design calculations, as the existing ODOT #57 aggregate fill under the concrete will eliminate this concern.

In addition, the proposed 36-inch high containment walls will be capable of containing the contents of the largest tank (20,000 gallons), plus the 25 year-24 hour rainfall event (4 inches). See the calculations provided in Appendix H to document the capacity for the proposed tank farm.

Construction drawings provided in Appendix E, show the proposed concrete pad and the worst-case tank layout (largest volume-greatest number of tanks). Design details and associated notes indicating

reinforcement details are also included, as well as materials of construction, EXPANSION/CONTRACTION JOINTS, tie-ins to existing concrete retaining walls, waterstops, construction joints in the walls and the floor and details of the collection sump. Drawing S-1 shows plan and sectional views, while Drawing S-2 shows construction details and provides notes to the contractors for bidding purposes. Drawing S-3 provides details of the proposed sub-surface drainage system.

4.2.7 Surface Water Management

Approximately 2-5 feet of fill material is located below the L-shaped area proposed for capping. This is underlain by a ten foot thick layer of native clay soil. This material serves as a low permeability barrier layer beneath the cap. This barrier layer was tested on April 11, 2000, using shelby tubes to obtain two undisturbed soil samples. The permeability was measured using ASTM Standard D-5084 (ASTM D-5084) Standard Test Method for Permeability of Cohesive Soils (Flexible Wall Permeameter). The average permeability of the undisturbed samples was 8.4 $x10^{-8}$ cm/sec. as documented in the laboratory analysis reports provided in Appendix I.

HCC presently maintains a water collection system for surface water in the form of sub-surface drainage system (perched water) that is contained in the fill that lies above the clay in and around the L-shaped area. The collection system proposed, will be utilized to cut-off or intercept subsurface drainage water from traveling beneath the proposed capped area (UNDER THE LOCATION OF THE NEW PROPOSED TANK LOCATIONS ON THE CAPPED AREA) as it is today.

The present collection system is comprised of a sump located in the L-shaped area (12 inch diameter clay tile pipe into ground, filled with gravel). Water collected in this sump is pumped to a central stormwater retention area located to the southeast of the existing air stripper. This retention area currently consists of four (4) 25,000 gallon aboveground storage tanks and one 100,000 gallon retention basin. This retention area is capable of containing the current and anticipated volume of stormwater and acts as an equalization basin for the air stripper treatment system. It is estimated that up to 70,000 gallons per day of water could be collected during a 25 year-24 hour rainfall event. Maximum daily volumes during minor rain events are estimated to be on the order of 5,000-10,000 gallons per day based on a ½ inch rainfall. These estimates are very conservative. Based upon historical pumping from the existing sump, peak volumes on the order of 1,000-2,000 gallons per day are anticipated.

The retention basin system will continue to be utilized to retain collected drainage water from the fill topographically upgradient of the proposed concrete cap over the L-shaped area. A french drain system, comprised of an ADS drainage wall collection system (AdvanEDGE specification sheets are provided in Appendix J), leading to a 4-inch diameter pipe(s), will be installed parallel to the western containment wall of the cap. This collection system will serve to convey surface water in the form of sub-surface drainage within the underlying fill to a central sump (1,000 gallon concrete vault or equivalent) as shown on Drawing S-1 in Appendix E. Water will then be pumped automatically to the existing retention area using a sump pump and level controls. The existing retention area system is capable of collecting the drainage anticipated as noted above. THE LOCATION OF THE PROPOSED DRAINAGE SYSTEM ALONG THE WESTERN CONTAINMENT WALL WAS SELECTED DUE TO LOCATION OF EXISTING

SOLVENT TANKS LOCATED JUST WEST OF THIS AREA. THESE TANKS PRECLUDE CONSTRUCTION OF THE SYSTEM FURTHER TO THE WEST, EVEN WITH THE WESTERN EDGE OF THE L SHAPED PORTION OF THE PROPOSED CONCRETE CAP.

Drainage (rainwater) from within the capped L-shaped containment area will also be conveyed to the retention basin via manual pumping, as needed. A 1-foot square collection sump has been incorporated in the design, which will collect surface drainage from the concrete surface. The concrete will be sloped toward the collection sump. The cap will collect rainwater that will contact the ~~3,600~~ 3,350 square foot coated surface.

4.2.8 Closure Cost Estimate

The following closure cost estimate is based upon year 2000 costs and includes all labor, materials and equipment necessary to complete closure by a third party ~~as.~~

CONSTRUCTION		
Concrete Pad ~~3,600~~ 3,350 feet^2 -12" thick with 12" thick sidewalls	~~$46,900~~	$43,900
Protective Concrete Coating 4,000 FEET^2	~~$3,000~~	$20,000
Equipment for Grading and Collection System Excavation		$6,400
Groundwater Collection Trench, Conveyance System and Vault		$16,000
Relocation Costs for 4 Existing Product Storage Tanks		$10,000
Sump Pump/Level Controls		$8,000
Subtotal	~~$92,300~~	$104,300
Engineering Oversight and Certification/Consulting Fees		$20,000
Subtotal	~~$112,300~~	$124,300
15% ~~20%~~ Contingency	~~$22,400~~	$18,645
Total Cost for Closure	~~$134,760~~	$142,945

Assumptions

1. Excavated cap perimeter berm soils and excess trench and vault soils will be placed under the proposed cap.
2. Sub-surface drainage collection system will be constructed utilizing a ditch-witch, will not exceed 5 feet in depth and will not exceed 100 feet in length.
3. Four existing tanks will have to be relocated to allow for construction of the concrete pad.
4. Costs for detailed design/Closure Plan development by engineering consultant are not included in this estimate.

5.0 CLOSURE CONTINGENCY PLAN

The method of closure specified in this Closure Plan for ~~both~~ the Former Hazardous Waste Tank Farm and the PREVIOUS CLOSURE ACTIVITIES CONDUCTED FOR THE Underground Cistern allows contaminated soils to remain in place and as a result, necessitates the use of Deed Restrictions for portions of the HCC property. Given that soil will remain in place, Post-Closure monitoring will be required. The post-closure monitoring will also serve to document ongoing natural attenuation processes. The Post Closure Plan is presented in Section 11.0. The use of a tank farm as a cap and the associated maintenance of the tank farm is expected to preclude the need for a Contingency Plan associated with impacted soil. Therefore, this Contingency Plan focuses entirely on a remedy that would be implemented in stages in the event that natural attenuation was not adequately addressing the groundwater impacts.

5.1 BACKGROUND

As discussed in Section 4.2.4.2, all monitoring wells (except well SW-1) will be sampled on a quarterly basis for a period of one-year following approval of this Closure Plan. Upon completing one-year of additional quarterly sampling, the frequency for sampling all monitoring wells will be reduced to ~~an annual~~ A SEMIANNUAL basis—THROUGHOUT THE PERIOD REQUIRED FOR POST-CLOSURE MONITORING (29 YEARS OF SEMI-ANNUAL SAMPLING ONLY). HOWEVER, AS ACKNOWLEDGED IN THE MARCH 26, 2001 OEPA LETTER AND DISCUSSED DURING AN APRIL 11, 2001 TELEPHONE CONVERSATION BETWEEN EARTH TECH AND THE OEPA, THE SEMI-ANNUAL SAMPLING FREQUENCY MAY BE REDUCED BASED ON MONITORING RESULTS. THEREFORE, HCC PLANS TO RE-EVALUATE THE SAMPLING FREQUENCY ON AN ANNUAL BASIS AND WILL PETITION THE OEPA TO ADJUST THE FREQUENCY, AS WARRANTED. ~~Select monitoring wells will continue to be sampled on a quarterly basis for a period of four years following the initial year of monitoring. The select wells include: well I; well C; well SW-2 and well SW-3. Upon completing the four years of quarterly sampling in these select wells, continued groundwater sampling will be limited to annual sampling in all monitoring wells throughout the period required for post-closure monitoring (30 years total, 25 years of annual sampling only).~~ In the event a Contingency Plan trigger is activated, the frequency and wells to be sampled will be adjusted as approved on a case by case basis by the OEPA. The groundwater sampling results and trigger assessment (statistical evaluation) will be presented in Groundwater Monitoring Reports that will be prepared and submitted to the OEPA following each sampling event.

As requested by the OEPA, HCC has developed a series of triggers that will be utilized to establish criteria for remedial actions should the monitored natural attenuation process proposed in this Closure Plan deviate from its present level of biological activity.

As discussed above, wells A, B, C and SW-4 are the only wells that currently exhibit a concentration above the Maximum Contaminant Levels (MCLs) as promulgated by the Safe Drinking Water Act (SDWA). There have also been historic exceedences of the MCLs in wells F, G, and SW-1, 2 and 3, although these wells have not exhibited concentrations exceeding the MCLs for quite some time. Wells SW-2 and SW-3 are located within the property and downgradient of the primary source area.

Although as presented in Section 4.2.3.1, the natural attenuation capacity of the Site is quite high, it is possible that concentrations of COCs exceeding the MCLs will be encountered again in downgradient wells SW-2 and SW-3. Based on the site-specific data for metabolites and end products, we anticipate that vinyl chloride is the mostly likely COC to exceed it's respective MCL (0.002 mg/l) in these wells. However, vinyl chloride readily degrades under aerobic or anaerobic conditions quite rapidly. Therefore, the VC that is produced will not accumulate, but will readily degrade to either CO_2 and H_2O or ethene. In addition, groundwater is not used for consumptive purposes and the groundwater discharge point (intermittent tributary of Tinkers Creek) receives runoff from industrial properties in the area. Therefore, any COCs that may migrate beyond the property boundary, which is considered unlikely, would not pose an unacceptable risk to human health or environmental receptors.

5.2 TRIGGERS THAT ACTIVATE THE CONTINGENCY PLAN

The statistical methods that will be used to evaluate the data are recommended and described in several references: Chapter 6 of USEPA, July 1992 (Methods for Evaluating the Attainment of Cleanup Standards, Volume 2: Ground Water); and, Chapter 4.1 and Appendix A-6 of USEPA, July 1992 (Statistical Analysis of Ground-water Monitoring Data at RCRA Facilities, Draft Addendum to Interim Final Guidance), and Appendix B, Table 5 of USEPA, July, 1989 (Statistical Analysis of Ground-water Monitoring Data at RCRA Facilities, Interim Final Guidance, EPA/530-SW-89-026).

HCC will perform an intra-well comparison through either a simple linear regression or group mean test analysis. This method provides a means to evaluate VOCs in groundwater. It will allow for a determination that the VOCs in the groundwater at the Site are not increasing.

A simple linear regression technique will be used to determine the slope of the concentration trend over time for methlyene chloride, the primary COC, as well as PCE, TCE, TCA, 1,1 DCA and VC in selected monitoring wells (well C, SW-2 and SW-3) based on groundwater analytical data collected to date. The slope of the regression line should be negative i.e., not show an increasing trend and the upper and lower confidence limits of the line should be negative in order to document stable or improving conditions.

Standard procedures will be followed to determine the suitability of linear regression methods to the existing data by using the F-test. The F-test indicates (statistically) how well the regression line fits the data trend. Specifically, if the probability of the F ratio (explained variance versus the unexplained variance) is less than 0.05, then the data are suitable for linear regression analysis and this type of evaluation will be conducted. Residuals concentrations (actual values minus predicted values) must also have similar variance over time to substantiate the use of the simple linear regression approach.

Should an increasing trend line exist or the confidence limits be positive for any constituent and well monitored for two or more consecutive quarters, then the trigger for that specific parameter in that specific well will be activated. Should this be the case, HCC will proceed to implement one of the three remedial measures specified below. The specific method selected will be parameter specific and dependent upon the

concentration detected and reconfirmed through confirmation sampling and analysis as discussed in Section 4.2.3.2 in this Closure Plan.

Should confirmatory sampling yield data below that of a trigger, then HCC will resume the monitoring program presently in place prior to activation of the trigger.

If the probability of the linear regression F-test is greater than 0.05 then a group mean approach would be utilized, specifically, either a t-test (if data are parametric) or Wilcoxon rank sum approach (if non-parametric). This method of data comparison evaluates early data versus recent data. In order for this USEPA approved method to be considered valid, the early data should be greater than the recent data. This is the case with the COCs at this Site. An arbitrary cutoff point (date) is established for COCs where a notable difference in data occurs.

The goal of each of these methods will also be to yield data that are indicative of decreasing trends for any well and individual COC. Should any constituent and well monitored indicate an increasing trend for two or more consecutive quarters, then the trigger for that specific parameter in that specific well will be activated. Should this be the case, HCC will proceed to implement one of the three remedial measures specified below. The specific method selected will be parameter specific and dependent upon the concentration detected and reconfirmed through confirmation sampling and analysis as discussed in Section 4.2.3.2 in this Closure Plan.

Should confirmatory sampling yield data below that of a trigger, then HCC will resume the monitoring program presently in place prior to activation of the trigger.

5.3 INCREASED MONITORING FREQUENCY

Should these trigger levels be reached and confirm deteriorating conditions for natural attenuation, HCC will institute a more rigorous groundwater monitoring program, by increasing the monitoring frequency to quarterly if, at the time the frequency is less. Increased monitoring will occur for a one-year period, at which time a report will be prepared to specify the contingency corrective actions proposed as a result of the trigger. Should it be deemed necessary to implement corrective actions, HCC will implement these measures within 60 days of approval from the OEPA.

5.4 OXYGEN RELEASE COMPOUND OR HYDROGEN RELEASE COMPOUND

Oxygen Release Compound (ORC®) is a proprietary formulation of magnesium peroxide (a phosphate-intercalated peroxygen) that slowly releases oxygen. ORC® can be utilized to enhance the dissolved oxygen concentration in groundwater to enhance the attenuation rate of aerobically biodegradable organic compounds. Literature regarding ORC® is presented in Appendix K. Although a number of the source COCs require anaerobic conditions to attenuate biologically, the predominant metabolites of these COCs are aerobically biodegradable. Therefore, in the event that significant increasing trends of these metabolites are encountered, ORC® may be utilized to enhance or supplement the attenuation process. The decision to utilize ORC® will depend on the concentration and specific constituent. It is anticipated that ORC® would

be installed as in-well socks in downgradient monitoring wells or injected along the northern property boundary.

Hydrogen Release Compound (HRC™) is a proprietary, food grade, polyacetate ester that, upon being deposited into the subsurface, slowly degrades to lactic acid. Lactic acid is then metabolized to hydrogen, which in turn drives the reductive dechlorination of chlorinated aliphatic hydrocarbons. HRC™ can be utilized to enhance the dissolved hydrogen concentration in groundwater to enhance the attenuation rate of anaerobically biodegradable organic compounds. Literature regarding HRC™ is presented in Appendix K. Many of the source COCs require anaerobic conditions to attenuate biologically. Therefore, in the event that significant increasing trends of COCs that degrade anaerobically are encountered, HRC™ may be utilized to enhance or supplement the attenuation process. The decision to utilize HRC™ will depend on the concentration and specific constituent. It is anticipated that HRC™ would be injected along the northern property boundary.

5.5 GROUNDWATER EXTRACTION AND TREATMENT

Based on the site-specific attenuation capacity of the Site it is considered unlikely that a groundwater extraction and treatment system would be installed. However, in the event that ORC® and/or HRC™ are ineffective or considered inappropriate, it is anticipated that the extraction system would be limited and would only be installed as necessary to avoid triggers. The precise configuration of the extraction system cannot be and should not be defined until the nature and extent of the trigger is realized. However, we anticipate that the extraction system would utilize an existing well or strategically placed new well. We also anticipate that the configuration of the treatment system would range from utilizing the existing air stripper to the installation of a new treatment system designed and configured to meet the specific requirements of the extraction system. It is anticipated that a pump test would be completed to define the flow capacity requirements and organic loading for the new treatment system. The operational duration of the extraction system would be a function of the significance of the trigger and would be discussed and agreed upon with the OEPA.

6.0 CLOSURE SCHEDULE

The schedule presented below has been developed to complete the closure activities as proposed in this Closure Plan. Estimated completion dates are based upon receipt of approval of the Closure Plan from the OEPA. Due to weather limitations, concrete curing time and the uncertainty of when the closure plan will be approved by the agency (summer, late fall, etc.), the schedule may need to be adjusted. HCC has based the schedule on the regulatory time frame specified in OAC 3745-55-13 and the facilities Part B Permit dated October 30, 1998.

Closure Implementation Schedule

Activity	Estimated Completion Date
OEPA Approval of Closure Plan	Not Applicable
Bid Project/Select Contractor	30 days after OEPA approval
Site Grading Activities	45 days after Contractor Selection
Placement and Compaction of Existing Aggregate Fill	90 days after Contractor Selection
Construction of Sub-surface Water Management System and Associated Piping, Vault and Level Controls	120 days after Contractor Selection
Construction of Concrete Cap and Containment Area for L-shaped Area	130 days after Contractor Selection
Application of Concrete Coating	145 days after Contractor Selection
Completion of Closure and Final Inspection	180 days after Contractor Selection
Submittal of Closure Certification Report to OEPA	240 days after Contractor Selection

7.0 PERSONNEL HEALTH AND SAFETY

HCC has developed a ~~Master~~ Health and Safety Plan (HASP) FOR INVESTIGATION AND REMEDIATION RELATED ACTIVITIES in accordance with the regulatory requirements of OSHA 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response." It has been prepared for the use of contractors working at HCC on a variety of environmental investigation, remediation, and construction tasks.

HCC has also developed a Master Health and Safety Plan (HASP) related to the storage and handling of facility specific wastes. This plan is similar to that discussed above, however, includes specific action levels for various chemicals utilized at the facility.

The purpose of the HCC HASPs are to summarize the project organization and safety responsibilities for employees, contractors and their subcontractors that may perform work at the HCC facility. It establishes Standard Operating Procedures (SOPs) for preventing accidents, injuries, and illnesses; identifies hazards, discusses the personal protective equipment that may be used at the Site; identifies personnel health and safety training requirements; summarizes the monitoring techniques to be used; establishes emergency procedures; describes the medical surveillance program; identifies appropriate first aid equipment and provides for accident reporting.

The HCC HASPs will be implemented by the contractor and any subcontractors during closure of the Former Hazardous Waste Tank Farm. Compliance with these HASPs is required of all personnel and their subcontractors that will be involved in the closure related activities on behalf of HCC. Assistance in implementing these plans can be obtained from the HCC EHS Engineer identified in Section 1.2 of the Plan. A copy of the HCC HASPs is provided as Appendix L of this Closure Plan. The selected closure and post-closure contractors at a minimum must follow the above noted plans, however, they may also develop a HASP that is equal to or more stringent than those provided in this Closure Plan.

Based upon the concentrations of contaminants that may be encountered during removal of the perimeter berm, regrading of materials in the location of the proposed cap, and intrusive activities related to the subsurface drainage collection system, it is anticipated that Level D personnel protection will be required. Should monitoring activities during closure detect concentrations above established action levels, site workers will upgrade to Level C personnel protective equipment.

8.0 DECONTAMINATION EFFORTS

Decontamination procedures for equipment, personal protective equipment and site workers are specified in the HCC HASP's provided in Appendix L.

Contact with contaminated materials is anticipated to be limited to soil in the L-shaped area that will be capped as it relates to grading activities, berm material around the perimeter of the L-shaped area and soil that will be removed during installation of the sub-surface drainage collection system. These materials will be placed under the cap area.

8.1 EQUIPMENT DECONTAMINATION AREA

During closure, efforts will be taken to limit equipment contact with soil and fill materials suspected to be contaminated. Heavy equipment and hand tools WILL REMAIN WITHIN THE LIMITS OF THE AREA TO BE CAPPED UNTIL ALL GRADING OF SOILS HAS BEEN COMPLETED. IN GENERAL, THE EQUIPMENT will THEN be steam cleaned and/or detergent washed following completion of waste material handling to remove visible solids. Decontamination wash and rinse water will be collected in a temporary bermed area constructed with polyethylene sheeting. Collected liquids will be pumped to HCC's treatment system prior to discharge to the Northeast Sewer District of Ohio POTW under HCC's discharge permit. Solids will be placed under the area proposed for capping.

HCC WILL HOLD A DECONTAMINATION BRIEFING WITH ALL CONTRACTORS INVOLVED WITH CLOSURE CONSTRUCTION ACTIVITIES AT THE INITIATION OF THE PROJECT. THE WORK AREA WILL BE SECTIONED OFF TO DELINEATE AN EXCLUSION ZONE, CONTAMINATION REDUCTION ZONE AND SUPPORT ZONE AS INDICATED ON DRAWING S-1. DRAWING S-4 SHOWS A LAYOUT OF THE EQUIPMENT DECONTAMINATION AREA, INCLUDING THE ABOVE SPECIFIED ZONES.

SPECIFIC EQUIPMENT DECONTAMINATION ACTIVITIES WILL INCLUDE THE REMOVAL OF VISIBLE SOLIDS FROM THE TRACKS, BUCKETS, BLADES, ETC., FROM THE HEAVY EQUIPMENT UTILIZED TO PERFORM GRADING ACTIVITIES DURING CLOSURE. THIS WILL OCCUR WITHIN THE EXCLUSION ZONE. A TRIPLE LINED (POLYETHYLENE SHEETING) TEMPORARY DECONTAMINATION AREA WILL BE CONSTRUCTED WITHIN THE CONTAMINATION REDUCTION ZONE, WHERE THE EQUIPMENT WILL BE SUBJECTED TO A WASH AND RINSE PROCESS, UTILIZING A STEAM CLEANER OR SIMILAR DEVICE. THE DECONTAMINATION AREA WILL BE BERMED UP WITH CLEAN SOIL/FILL AND SECURED UTILIZING SAND BAGS, STRAW BALES OR SIMILAR ON THE OUTSIDE. THE EQUIPMENT WILL AT THIS POINT BE CONSIDERED CLEAN AND WILL THEN BE MOVED TO THE SUPPORT ZONE. ANY EARTHWORK IN THE CAPPED AREA AT THIS POINT, INCLUDING THE INSTALLATION OF THE GRAVEL FILL LAYER WILL BE CONSIDERED TO OCCUR IN A CLEAN AREA. THE GRAVEL WILL BE PUSHED INTO THE AREA TO BE CAPPED BY HEAVY EQUIPMENT THAT WILL REMAIN ON THE GRAVEL SURFACE DURING ITS INSTALLATION TO AVOID CONTACT WITH THE UNDERLYING SOILS.

8.2 PERSONNEL DECONTAMINATION AREA

Decontamination of personnel in Level D will consist of:

- Removal and disposal of coveralls;
- Removal and disposal of outer gloves;
- Removal, cleaning, and storage of respiratory equipment (if worn);
- Removal and disposal of inner gloves; and,
- Washing other non-disposable protective equipment (i.e., hard hat, safety glasses/goggles, etc.) suspected of being contaminated using soap and water as necessary.

~~The Solvent Processing area has a dedicated drum disposal area for contaminated PPE. Washing of non-disposable protective equipment will be conducted in the employee restroom area located across from the yellow emergency supply cabinet.~~

THE WORK AREA WILL BE SECTIONED OFF TO DELINEATE AN EXCLUSION ZONE, CONTAMINATION REDUCTION ZONE AND SUPPORT ZONE AS INDICATED ON DRAWING S-1. DRAWING S-4 SHOWS A LAYOUT OF THE PERSONNEL DECONTAMINATION AREA, INCLUDING THE ABOVE SPECIFIED ZONES.

ANY HANDTOOLS UTILIZED WILL BE PLACED IN THE DESIGNATED EQUIPMENT DROP AREA AND REMAIN IN THIS LOCATION UNTIL ALL INTRUSIVE WORK IN THE AREA TO BE CAPPED IS COMPLETED. SPECIFIC DECONTAMINATION ACTIVITIES WILL INCLUDE THE REMOVAL OF VISIBLE SOLIDS FROM HANDTOOLS FOLLOWING A SERIES OF WASH AND RINSE STEPS THAT WILL TAKE PLACE IN PLASTIC WASH TUBS SET IN A PLASTIC LINED (POLYETHYLENE SHEETING) AREA. PERSONNEL DECONTAMINATION IS EXPECTED TO BE MINIMAL AS THE MAJORITY OF WORK IN THE AREA TO BE CAPPED WILL TAKE PLACE WITH HEAVY EQUIPMENT.

AT THE END OF EACH WORK SESSION, ANY INDIVIDUALS THAT ARE IN THE EXCLUSION ZONE WILL EXIT THE AREA IN A SIMILAR MANNER AS DESCRIBED FOR THE HAND TOOLS DECONTAMINATION PROCESS ABOVE. VISIBLE SOLIDS WILL BE REMOVED IN THE EXCLUSION ZONE, FOLLOWED BY THE WASH AND RINSE PROCESS UTILIZNG SCRUB BRUSHES. DISPOSABLE PPE WILL BE PLACED IN PLASTIC GARBAGE BAGS AT THE END OF THE CONTAMINATION REDUCTION ZONE.

ALL WASH AND RINSEWATERS WILL BE TREATED THROUGH HCC'S AIR STRIPPER, WHILE SOLIDS WILL BE PLACED IN THE AREA TO BE CAPPED. PLASTIC LINERS, DISPOSABLE PPE AND OTHER DEBRIS GENERATED DURING THE DECONTAMINATION PROCESS WILL BE MANAGED WITH HCC FACILITY HAZARDOUS WASTE PPE AND DISPOSED OF IN ACCORDANCE WITH APPLICABLE REGULATIONS.

9.0 SECURITY

The HCC facility is completely enclosed with a six-foot high, chain link fence topped with barbed wire. Five main gates and one man-gate exist, two at the northeast corner, one at the southeast drive, one in the center portion of the drive, and one on the southwest portion of the drive.

The HCC visitors gate shall be utilized at all times for site access during closure activities. The use of other access points must be pre-approved by the HCC EHS Engineer, as these gates are critical to facility operations.

Visitors to HCC are required to report to the main office to sign in prior to site access, and before accessing the work zone(s). Visitors must sign in and out daily under the direction of an HCC employee for the duration of their approved visit. Under no circumstances will visitors be allowed to interfere with or participate in process operations outside the scope of intended facility activities. All visitors shall be escorted throughout the facility by an appropriately trained HCC employee. These existing procedures will be followed during closure activities.

HCC has posted signs at all fence gates and at various locations along the facility fence that are clearly visible from a distance of 25 feet. The signs indicate "Danger-Unauthorized Personnel Only-Keep Out".

10.0 CLOSURE CERTIFICATION AND NOTATIONS

This section discusses closure certification and required notices that must be submitted upon completion of specified closure activities.

10.1 CERTIFICATION

Within 60 days from completion of Closure, HCC and an independent registered Ohio Professional Engineer will submit a certification to the OEPA Director that closure has been completed in accordance with the approved Closure Plan as specified in OAC 3745-55-15 and 3745-50-42 and the facilities October 30, 1998 Facility Installation and Operation Permit # 02-18-0315. Signed certification statements will be provided by HCC and the registered Ohio Professional Engineer using the verbiage specified under OAC 3745-50-42. A Certification Report will be prepared by the registered Ohio Professional Engineer summarizing closure activities. This report will be retained by HCC and provided to the OEPA Director. ~~upon request.~~

During closure, the registered Professional Engineer will visit the Site periodically during key construction activities to observe and document activities and to assure closure is being conducted in accordance with the approved Closure Plan.

10.2 NOTICE IN DEED AND TO LOCAL LAND AUTHORITY

Because the method of closure as specified in this Closure Plan does not include removal of contaminated soils, HCC is required to submit a notice to the local land authority AND TO THE DIRECTOR OF THE OEPA and MODIFY ~~in~~ the deed to the property as per OAC 3745-55-16 and OAC 3745-55-19.

Within 60 days following completion of closure, HCC will submit to the local land authority and/or zoning authority (City of Bedford) AND TO THE DIRECTOR OF THE OEPA a survey ~~plan~~ PLAT indicating the location and dimensions of the closed Former Hazardous Waste Tank Farm and the Underground Cistern with respect to permanently surveyed benchmarks. This ~~plan~~ PLAT will be prepared and certified by a professional land surveyor registered in Ohio. As required, the ~~plan~~ PLAT will contain a note which states HCC's obligation to restrict disturbance of the Site and a record of the type, location and quantity of waste remaining in the Former Hazardous Waste Tank Farm and the Underground Cistern areas.

HCC is also required to provide a notation in the deed to the facility, or some other instrument which is normally examined during a title search, to document the use of portions of the property as specified in OAC 3745-55-19. This notation must be sufficient to notify any potential purchaser of the property that the closed units have been used to manage hazardous waste and that future use of the areas occupied by these units is restricted. UPON COMPLETING THE PROPOSED CLOSURE ACTIVITIES, HCC WILL SUBMIT A COPY OF THE AMENDED DEED, ALONG WITH A CERTIFICATION THAT THE NOTATION IN THE DEED HAS BEEN MADE AND RECORDED PER OAC 3745-55-19(C).

11.0 POST-CLOSURE PLAN AND CARE

This section of the Closure Plan provides the post-closure plan and addresses post-closure care requirements as specified in OAC 3745-55-17 and OAC 3745-55-18.

11.1 POST-CLOSURE PLAN

HCC is required to perform post-closure monitoring, maintenance and inspections of the closed Former Hazardous Waste Tank Farm and the Underground Cistern per OAC 3745-55-17. ALL GROUNDWATER MONITORING WILL BE CONDUCTED IN ACCORDANCE WITH OAC 3745-54-90 THROUGH 10099, ~~3745-55-01~~, and 3745-55-011.~~, AND 3745-55-02~~. The following sections specify the post-closure activities that will be performed during the post-closure care period.

11.1.1 Former Hazardous Waste Tank Farm

The existing groundwater monitoring network consists of 10 downgradient wells and 2 upgradient wells (one upgradient well to be abandoned). HCC will perform quarterly AND SEMIANNUAL monitoring as specified in Section 4.2.4 of this Closure Plan, for the required 30-year duration, or until such time that remaining concentrations do not represent a continued threat of off-site migration. Should this occur, HCC will petition the OEPA to reduce the post-closure care period.

Groundwater samples will be collected and evaluated for VOC's and selected natural attenuation parameters as presented in Section 4.2.4.2 of this Closure Plan. Sampling and analytical protocols discussed in the Quality Assurance Project Plan/Sampling and Analysis Plan included in Appendix D will be followed.

HCC will perform inspections of the closed Former Hazardous Waste Tank Farm to assure cap integrity, including the impermeable protective coating, maintain security measures including perimeter fencing and warning signs, insure the functionality of the sub-surface drainage collection system and insure the integrity of the groundwater monitoring wells. SPECIFIC ITEMS TO BE INSPECTED, ALONG WITH FREQUENCIES ARE DETAILED IN SECTION 11.2.1 OF THIS CLOSURE PLAN.

11.1.2 Underground Cistern

Groundwater monitoring will be conducted following the same procedures and protocols as outlined above for the Former Hazardous Waste Tank Farm.

HCC will perform inspections of the closed Underground Cistern to insure the integrity of the concrete filled cistern, maintain security measures including perimeter fencing and warning signs and insure the integrity of the groundwater monitoring wells. Specific items to be inspected, along with frequencies are detailed in Section 11.2.1 of this Closure Plan.

11.1.3 Post-Closure Cost Estimate

The following 30-year post-closure cost estimate is based upon year 2000 costs and includes all labor, materials and equipment necessary to perform inspections, maintenance, repair or replacement costs for applicable items, and costs for groundwater monitoring services by a third party.

I.	**Ground-Water Monitoring (2000 Dollars)**	
	All Well - Sampling and Analysis (4 Quarterly events then ~~annually~~ SEMIANNUALLY for years 2 - 30; ~~33~~ 62 total events) ($8,000/event)	~~$264,000~~ $496,000
	~~Select Well - Sampling and Analysis (3 events/year; years 2-5; 12 events total) ($3,000/event)~~	~~$36,000~~
	~~*Groundwater Monitoring Subtotal*~~	~~**$300,000**~~
II.	**Inspections**	
	Inspection (4/year) - 1 man, 2 hours/inspection @ $50/hour	$12,000
III.	**Maintenance and Supplies**	
	Concrete Surface Coating AND REPAIRS- ~~3,600~~ 4,000 ft.^{2}/15 years	~~$3,000~~ $31,500
	Concrete Repairs - 5 yd.^{3}/5 years @ $100/yd.^{3}	$3,000
	Fence repairs and security gate replacement, benchmark replacement	$6,000
	Sub-surface drainage system, collection vault, piping cleanout and repairs, replacement of sump pump and level controls 2 days/year - @ $200/day plus $1,000/ 10 years	$15,000
	Groundwater monitoring well redevelopment-2 Events 11 wells - 2 men @ $50.00/hour - 2 hours/well	$4,400
	Groundwater monitoring well redevelopment-2 Events 11 wells - 2 men @ $50.00/hour - 2 hours/well	$8,000
	Miscellaneous materials - $500/year	$15,000
	Maintenance and Supplies Subtotal	~~$54,400~~ $82,900
IV.	**Engineering Oversight and Certification**	$15,000
	Subtotal	~~$381,400~~ $605,900
V.	**Administration (5%)**	~~$19,070~~ $30,295
		Grand Total ~~$400,470~~ $636,195

11.1.4 Financial Assurance

HCC currently maintains financial assurance documentation for post-closure care as specified in this Closure Plan in accordance with OAC 3745-55-45 and the facilities October 30, 1998 Facility Installation and Operation Permit # 02-18-0315. Financial assurance for facility closure has already been obtained and copies of required documentation have been submitted to the OEPA.

HCC maintains Hazardous Waste Liability Insurance through American International Specialty Lines Insurance Company, in the amount of $630,000 for each occurrence and in aggregate. A copy of the current policy is provided in Appendix M.

11.1.5 Post-Closure Certification

Within 60 days from completion of the post-closure care period, HCC and an independent registered Ohio Professional Engineer will submit a certification to the OEPA Director that post-closure care has been completed in accordance with the approved Closure Plan as specified in OAC ~~3745-55-15~~ 3745-55-20 ~~and 3745-50-42~~ and the facilities October 30, 1998 Facility Installation and Operation Permit # 02-18-0315. Signed certification statements will be provided by HCC and the registered Ohio Professional Engineer using the verbiage specified under OAC 3745-50-42. A Post-Closure Certification Report will be prepared by the registered Ohio Professional Engineer summarizing post-closure care activities. This report will be retained by HCC and provided to the OEPA Director ~~upon request~~.

During the post-closure care period, the registered Professional Engineer will visit the Site periodically to observe and document post-closure activities and to assure post-closure activities are being conducted in accordance with the approved Closure Plan.

11.2 POST-CLOSURE CARE

HCC is required to perform post-closure care activities including: groundwater monitoring; maintenance; and, inspections of the closed Former Hazardous Waste Tank Farm and the Underground Cistern per OAC 3745-55-17. The following sections specify the post-closure activities that will be performed during the 30-year post-closure care period. ALL GROUNDWATER MONITORING WILL BE CONDUCTED IN ACCORDANCE WITH OAC 3745-54-90 THROUGH 10~~99, 3745-55-01~~, and 3745-55-011~~, AND 3745-55-02~~.

11.2.1 Inspections

HCC will inspect the 11 groundwater monitoring wells during each sampling event for physical damage. The steel outer protective casings, inner PVC casings, locks and concrete pads surrounding the wells will be inspected for general condition, plumbness and functionality. Any items that are in need of repair or replacement will be documented and repaired or replaced as soon as practicable.

HCC will also inspect the concrete cap, containment walls and joints of the Former Hazardous Waste Tank Farm, as well as the condition of the impermeable protective concrete coating and associated collection

sump on a WEEKLY ~~quarterly~~ basis for physical damage, cracks and general condition. THE PROTECTIVE COATING WILL BE EXAMINED FOR CHIPS, CRACKS, PEELING OR CHANGE IN COLORATION OF THE COATING. The closed underground cistern area will also be inspected for any obvious signs of settling or cracking of the concrete covered (capped) surface. Any debris noted in the areas will be removed and discarded accordingly.

The sub-surface drainage system adjacent to the closed Former Hazardous Waste Tank Farm, associated concrete vault, piping, sump pump and level controls will be inspected and tested quarterly for general condition, functionality, deposition of solids, evidence of cracks or obvious leaks. Any items that are in need of repair/replacement or cleaning will be documented and addressed as soon as practicable.

11.2.2 Maintenance

HCC will perform routine maintenance of the monitoring wells including painting and relabeling of the protective well casings, concrete pads and padlocks should they become worn cracked or severely rusted. Monitoring wells will be redeveloped if deemed necessary, to maintain low turbidity levels for sampling, following removal of a minimum of three well volumes, should they become turbid. Any well damaged during the post-closure care period will be replaced with a similar well screened across the same interval.

The sub-surface drainage system will be cleaned periodically using a sewer jet, high pressure water or similar device or methods to maintain free flowing conditions. Should sediment buildup in the concrete vault, materials will be removed using a vacuum truck or similar device to maintain free flowing conditions. Level control sensors or floats will also be cleaned routinely per manufacturer's recommendations. The sump pump will be checked and cleaned routinely per manufacturer's recommendations. If the pump should become damaged or no longer function, it will be replaced with a similar model of like characteristics.

The concrete cap over the Former Hazardous Waste Tank Farm will be inspected at least WEEKLY ~~quarterly~~ to ~~access~~ASSESS its condition. The surface coating will also be inspected for DAMAGE AS NOTED ABOVE IN SECTION 11.2.1. The sump will be inspected at least weekly and immediately following rain events to maintain an empty condition.

Any damage noted during routine inspections, will be repaired as soon as practicable. Concrete will be repaired should cracks develop. Visible cracks will be filled with CHEMLINE caulking immediately upon discovery and the affected area recoated with the ~~Railine~~ CHEMLINE coating, ~~Siloxirane 2032~~ 784/32, by Advanced Polymer Coatings. Manufacturer's recommendations will be followed for reapplication of affected areas. A SPECIFIC COATING REPAIR PROCEDURE FOR THE CHEMLINE 784/32 HAS BEEN INCLUDED IN APPENDIX F.

The concrete surface over the underground cistern will be inspected for cracks and settling. Any cracks will be filled with polysulfide caulking immediately upon discovery. Settling is not expected at this time, as the cistern was filled in April of 1993. Should it become evident, additional concrete will be utilized to bring the area to grade.

The security fence, gates and warning signs will be inspected quarterly for damage and any necessary repairs completed as soon as practicable. Warning signs will be replaced should they become illegible.

11.2.3 Security

As discussed in Section 9.0 of this Closure Plan, the HCC facility is completely enclosed with a six-foot high, chain link fence, topped with barbed wire. Five main gates and one man-gate exist at various access points around the facility. The HCC visitors gate will be utilized at all times for site access during post-closure activities, as it is today. The use of other access points must be pre-approved by the HCC EHS Engineer, as these gates are critical to facility operations.

Visitors to HCC will continue to report to the main office to sign in prior to site access, and before accessing the work zone(s), as required today. Visitors will sign in and out daily under the direction of an HCC employee for the duration of their approved visit. Visitors will be escorted throughout the facility by an appropriately trained HCC employee. These existing procedures will be followed during post-closure activities.

11.2.4 Recordkeeping

During the post-closure care period, HCC will perform routine groundwater monitoring activities, conduct inspections of the closed Former Hazardous Waste Tank Farm and Underground Cistern and conduct maintenance and repairs as necessary to maintain systems in operating condition and insure cap integrity.

Groundwater monitoring well sampling and analysis will be performed quarterly initially during the post-closure period. Sampling log sheets, laboratory Chain of Custody Records and analytical reports will be maintained on-site and incorporated into the facility Operating Record following sampling events. Groundwater Monitoring Reports will be prepared and submitted to the OEPA following each sampling event. The Groundwater Monitoring Reports will include: a statistical evaluation including a trigger assessment; a Groundwater Contour Map; and, a discussion regarding the geochemical conditions and natural attenuation parameters. These records will be maintained throughout the post-closure care period and until such time that the Director concurs that the facility post-closure care period can be discontinued.

Inspection records will be maintained for a minimum of three years from the date of the inspections. Copies of inspection reports will be maintained in the facility Operating Record. An inspection log will also be maintained to document inspections conducted at the facility.

Maintenance records will also be maintained on-site and incorporated into the facility Operating Record following completion. Copies of documentation will be maintained in the facility Operating Record throughout the post-closure care period to aid in post-closure certification, and, until such time that the Director concurs that the facility post-closure care period can be discontinued.

12.0 REFERENCES

Eder, 1986. *Proposed Investigation for the Certification Regarding Potential Releases from the Solid Waste Management Units*. Hukill Chemical Corporation – Bedford, Ohio.

Eder, 1988. *Site Investigation Report, Revision 1*. Hukill Chemical Corporation – Bedford, Ohio.

Eder, 1989. *Review of Alternative Corrective Actions Report*. Hukill Chemical Corporation – Bedford, Ohio.

Eder, 1989. *Corrective Action Study Report*. Hukill Chemical Corporation – Bedford, Ohio.

Eder, 1990. *Closure Plan for Solvent Tank Farm and Underground Cistern*. Hukill Chemical Corporation – Bedford, Ohio.

Eder, 1991. *Closure Plan for Solvent Tank Farm and Underground Cistern*. Revision No. 1. Hukill Chemical Corporation – Bedford, Ohio.

Eder, 1994. *Closure Plan for Solvent Tank Farm and Underground Cistern*. Revision No. 2. Hukill Chemical Corporation – Bedford, Ohio.

Leader, 1998. *RCRA Closure Plan for the Solvent Tank Farm, Underground Cistern and Groundwater Corrective Action Plan*. Hukill Chemical Corporation – Bedford, Ohio.

Earth Tech, 1999. *Detailed Closure Proposal*. Hukill Chemical Corporation – Bedford, Ohio.

Eder, 1987. *Site Investigation Report*. Hukill Chemical Corporation – Bedford, Ohio.

U.S. EPA 1997. *Draft EPA Region 4 Suggested Practice for Evaluation of a Site for Natural Attenuation (Biological Degradation) of Chlorinated Solvents.* Version 3.0.

Belay, N., and L. Daniels. 1987 *Production of Ethane, Ethylene and Acetylene from halogenated Hydrocarbons by Methanogenic Bacteria*. Applied and Environmental Microbiology. Volume 53.

Egli, C., R. Scholtz, A. M. Cook, and T. Leisinger. 1987. *Anaerobic Dechlorination of Tetrachloromethane and 1,2-dichloroethane to Degradable Products by Pure Cultures of Desulfobacteium sp. and Methanobacterium sp. FEMS Microbiology*. Lett. 68.

RTDF, 1998. *Natural Attenuation of Chlorinated Solvents in Groundwater* – training Course Workbook. Prepared by the Industrial Members of the RTDF Bioremediation Consortium.

Earth Tech, 1999. *RCRA Monthly Progress Report No. 2*. Hukill Chemical Corporation – Bedford, Ohio.

Puls, R. W. and Barcelona, M. J. 1996. *Low-flow (Minimal Drawdown) Ground-water Sampling Procedures.* United States Environmental Protection Agency, Office of Research and Development, Office of Solid Waste and Emergency Response. Document EPA/540/S-95/504.
ASTM (The American Society for Testing and Materials) Standard Procter Test. ASTM Method D-698.

ASTM. ASTM Method A-615.

ASTM. ASTM Method C-31.

ASTM. ASTM Method C-39.

U.S. EPA 1992. *Methods for Evaluating the Attainment of Cleanup Standards.* Volume 2: Groundwater.

U.S. EPA 1992. Statistical Analysis of Ground-water Monitoring Data at VRCRA Facilities. Draft Addendum to interim Final Guidance.

RCRA Corrective Measures Implementation Plan

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US EPA No. OHD 001 926 740
Ohio Permit No. 02-18-0315

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May 2000
REVISED APRIL 2001
REVISED JUNE 2005

1.0 INTRODUCTION

This RCRA Corrective Measures Implementation (CMI) Plan (CMI Plan) was prepared, on behalf of Hukill Chemical Corporation (HCC), to meet corrective action obligations outlined in their approved RCRA Part B Permit (U.S. EPA ID No.: OHD 001 926 740 and Ohio ID No. 02-18-0315). This CMI Plan is intended to supplement the Revised RCRA Closure Plan (Closure Plan) and should be reviewed in consideration of the content of the Closure Plan. Rather than to duplicate the corrective action discussion entirely, the corrective actions proposed as part of the closure process are also outlined in the Closure Plan because the proposed corrective actions are the same for meeting both requirements. This Report presents a discussion for plans to cap the solvent tank farm Solid Waste Management Unit (SWMU) which is not subject to RCRA Closure requirements and commits to a site-wide natural attenuation remedy for impacted groundwater. This Report also meets corrective action requirements set forth in HCCs approved Part B Permit (U.S. EPA ID No.: OHD 001 926 740 and Ohio ID No. 02-18-0315).

THIS RCRA CORRECTIVE MEASURES IMPLEMENTATION PLAN HAS BEEN REVISED IN REPONSE TO A MARCH 26, 2001 NOTICE OF DEFICIENCY (NOD) FROM THE OEPA.

1.1 OBJECTIVES

The objectives of this CMI Plan are to:

- present a revised approach to closure of the former hazardous waste tank farm and the former underground cistern both of which are regulated hazardous waste management units (HWMU's);
- address previous comments from the Ohio Environmental Protection Agency (OEPA) as they pertained to prior Corrective Action reports prepared by Eder Associates Consulting Engineers, P.C. (Eder) and Leader Environmental, Inc. (Leader); ~~and,~~
- ADDRESS COMMENTS FROM THE OEPA IN RESPONSE TO THE MARCH 26, 2001 NOD; AND,
- To present an approach that collectively addresses Corrective Action associated with the solvent tank farm Solid Waste Management Unit (SWMU) and site-wide groundwater impacts.

1.2 ORGANIZATION

The CMI Plan includes the following sections:

- Description of Facility and Environmental Conditions (Section 2.0);
- Description of the Solid Waste Management Unit Subject to Corrective Action (Section 3.0);
- Approach to Corrective Action (Section 4.0);
- Corrective Action Contingency Plan (Section 5.0);
- Schedule for Corrective Action (Section 6.0); and,
- References (Section 7.0).

1.3 PREVIOUS CORRECTIVE ACTION SUMITTALS

Although traditional RCRA Corrective Action terminology was not utilized in Eder's various Site Investigation Reports, the reports collectively constitute an approved RCRA Facility Investigation (RFI) Report, which the OEPA acknowledged in a March 28, 2000 letter. In addition, Eder's Review of Alternative Corrective Actions Report and Corrective Action Study Report collectively constitute an approved RCRA Corrective Measures Study (CMS) Report which the OEPA also acknowledged in their March 28, 2000 letter.

2.0 DESCRIPTION OF FACILITY AND ENVIRONMENTAL CONDITIONS

A detailed description of the Site is presented in Section 2.0 of the Closure Plan.

2.1 GENERAL SITE DESCRIPTION

HCC owns and operates a chemical distribution center and solvent recovery facility, which is located in an industrial park at 7013 Krick Road, Bedford, Cuyahoga County, Ohio. The Site location is shown on Figure 1. HCC has been in business since 1968 at the same address. Prior to this, Best Foundry, a manufacturer of military cannons during World War I was reported to be in this location.

Operations at HCC involve the processing of hazardous waste solvents. These materials are delivered in 55-gallon drums or in bulk, via tank trucks, and are stored for a short time prior to processing. Solvents are distilled and stored prior to shipment off-site for reuse. Residues generated from processing operations are shipped off-site to approved treatment/disposal facilities. The Site Base Map is shown on Figure 2. As discussed above, the Site contains regulated HWMUs subject to RCRA closure requirements and SWMUs subject to RCRA corrective action requirements. Figure 3 presents the location of the two HWMUs and SWMU on the Site.

3.0 DESCRIPTION OF SOLID WASTE MANAGEMENT UNIT SUBJECT TO RCRA CORRECTIVE ACTION

This section describes the Solvent Tank Farm in terms of its current and past operation, configuration and types of products that were stored and distributed.

3.1 SOLVENT TANK FARM

The Solvent Tank Farm is utilized by HCC to store reclaimed solvents in above ground steel storage tanks. The former Hazardous Waste Tank Farm HWMU is located entirely within the boundary of the solvent tank farm as shown on Figure 2. The southern and eastern sides of the area are bound by 30-inch high concrete walls associated with the secondary containment systems for adjacent tank farms, while the northern and western sides are bound by an earthen dike, approximately 3 feet high.

The base of the Solvent Tank Farm is comprised of gravel ranging in thickness from two to five feet. Alluvial till lies below the gravel, which results in ponding of the area during heavy rains. This area is dewatered by pumping accumulated water from a central collection sump located in the north-central portion of the tank farm. The collected water is pumped to a stormwater retention system and ultimately is treated through an air stripper and discharged to the sanitary sewer. The sump is believed to consist of a 12-inch diameter, gravel filled clay tile pipe, approximately 3 feet long.

3.1.1 Source Constituents

A variety of solvents containing chlorinated and petroleum hydrocarbons are stored in the Solvent Tank Farm. No hazardous wastes have been stored within the SWMU. However, the products contain the same general constituents that were utilized in the Former Hazardous Waste Tank Farm. Therefore, the Constituents of Concern (COCs) in soil and groundwater are also consistent with the constituents that were utilized in the Former Hazardous Waste Tank Farm.

3.1.2 Distinction Between HWMU and SWMU

Although traditional RCRA Corrective Action terminology has not been utilized for previous reports, it is apparent that the discussion of "closure" in the context of corrective actions led to some confusion with regard to previous Closure Plan and Corrective Action submittals to the OEPA. The regulated HWMU's must be formally closed pursuant to applicable regulations, but the closing of these regulated units has always been considered a component of the corrective actions that are necessary to complete the closure process. Corrective actions can be necessary as part of the closure of regulated units, but may also be required as a component of an approved Part B Permit (e.g. the RCRA Corrective Action process) for SWMU's not subject to formal closure requirements. The site-specific circumstances necessitate that corrective actions are conducted as part of the closure process, but also to address overall RCRA Corrective Action requirements specified in the approved Part B Permit.

This CMI Plan outlines corrective actions that are necessary to address groundwater impacts on a site-wide basis and to address soil impacts at the solvent tank farm SWMU. The attached Closure Plan

proposes natural attenuation as a remedy to address groundwater impacts associated with the regulated HWMUs and capping to address soil impacts at the former Hazardous Waste Tank Farm. Rather than to duplicate the corrective action discussion entirely, the groundwater corrective actions proposed as part of the closure process are discussed in more detail in the Closure Plan because the proposed corrective actions are the same for meeting both requirements.

4.0 APPROACH TO CORRECTIVE ACTION

This section describes the corrective action approach proposed for the Solvent Tank Farm, including soils management, groundwater management and capping.

4.1 SOLVENT TANK FARM

4.1.1 General Approach

HCC intends to construct an alternative landfill capping system over the existing Solvent Tank Farm that is consistent with the capping design for the former Hazardous Waste Tank Farm as presented in the attached Closure Plan. Although the capping is proposed to be completed at the former Hazardous Waste Tank Farm immediately upon receipt of approval from the OEPA, the capping at the Solvent Tank Farm will be constructed in phases over a five year period as previously discussed with the OEPA on several occasions. The OEPA has also previously acknowledged that a phased capping approach would be acceptable for the solvent tank farm SWMU. The area to be capped in phases (SWMU Cap) is presented on Figure 41.

The benefits of a capping system, which are discussed in detail in the attached Closure Plan, will also be realized at the solvent tank farm. Although the capping is not subject to the Closure Performance Standard as specified in OAC 3745-55-11 (as the HWMU Cap is), HCC proposes to construct the solvent tank farm cap consistent with the HWMU Cap.

Initial site grading and preparation work will be conducted based on a new topographic survey that will be completed. This will result in a minimum 12-inch thick aggregate fill layer (comprised of existing ODOT #57 and minor amounts of ODOT #4), which will serve to support the cap. The aggregate will be compacted. The concrete cap, WHICH WILL BE ENHANCED WITH IPANEX TO REDUCE THE PERMEABILITY, INCREASE THE DURABILITY AND INCREASE THE CORROSION RESISTANCE OF THE CONCRETE, will then be constructed on top of the aggregate fill, followed by application of an impermeable coating for protection of the concrete. HCC intends to utilize this area for a chemical storage tank farm for its process.

Maintenance of the cover system will be minimized, as the concrete itself is very durable, unlike a soil cover system, which is subject to erosion. Given that the concrete cap will prohibit direct contact with impacted sub-soils and eliminate infiltration impacts to groundwater, the alternative capping system will control, minimize or eliminate threats to human health and the environment.

4.1.2 Soils

Previous site investigations were conducted as part of the initial and follow-up site activities as outlined in the Site Investigation Report (Eder-April 1987) and Site Investigation Report - Addendum No. 1 (Eder-August 1988). Figure 8 presents the location of soil borings and the area exhibiting elevated COC

concentrations in the vicinity of the Solvent Tank Farm. Concentrations ranged from 0.789 mg/kg to 991 mg/kg, generally increasing with depth. No additional investigations are believed to be necessary.

4.1.3 Groundwater

Impacted groundwater will be addressed using a monitored natural attenuation approach that will include a groundwater monitoring program to confirm the continued effectiveness of the ongoing attenuation. ALL GROUNDWATER MONITORING WILL BE CONDUCTED IN ACCORDANCE WITH OAC 3745-54-90 THROUGH 10099, 3745-55-01, and 3745-55-011., AND 3745-55-02.

4.1.3.1 Natural Attenuation Assessment

As discussed in Section 4.2.3.1 of the attached Closure Plan, the site-specific biogeochemical parameter data provide evidence that the groundwater conditions support and promote natural attenuation of the COCs. Natural attenuation processes have resulted in decreasing concentrations and the COC plume has stabilized. The natural attenuation assessment revealed anaerobic conditions within the aquifer, sufficient nutrients and terminal electron acceptors (TEAPs), and key evidence of end (degradation) products.

4.1.3.2 Monitored Natural Attenuation Groundwater Remedy

Given the significant attenuation capacity that has been demonstrated, natural attenuation is proposed as a site-wide remedy for addressing impacted groundwater. Groundwater monitoring to confirm the attenuation process is an integral component of a natural attenuation remedy. Therefore, a Groundwater Monitoring Plan was developed and is discussed below.

Given that impacted soil will not be removed from the Site or treated and that a passive groundwater remedy (natural attenuation) is proposed, a Contingency Plan consisting of an alternative groundwater remedy was also developed and is presented in Section 5.0 below. The Contingency Plan proposes a series of miletones or triggers that must be reached prior to activating the Contingency Plan. The Contingency Plan is also established in stages based on the significance of the "trigger". The triggers are based on the COC concentrations encountered in downgradient monitoring wells. Prior to initiating the Contingency Plan, a confirmatory sampling event will be initiated immediately upon encountering the trigger concentration. If the trigger concentration persists, the Contingency Plan will be activated in stages, as defined below. If the trigger concentration is unconfirmed during the confirmatory sampling event, routine monitoring will be reinstated.

4.1.4 Groundwater Monitoring Plan

Groundwater monitoring is an integral component of the selected groundwater remedy. The Site-specific Quality Assurance Project Plan (QAPjP) outlines data quality objectives (DQOs) and sets quality acceptance criteria for data generated to meet the DQOs. The QAPjP is presented in Appendix D.

Details associated with the Groundwater Monitoring Plan (GMP) are presented in Section 4.2.4 of the Closure Plan. The GMP should be utilized in conjunction with the QAPjP to ensure that data quality objectives are reached and that the selected groundwater remedy is addressing the groundwater impacts sufficiently. The DQOs for this project are: to monitor the progress of natural attenuation processes and confirm that the attenuation capacity of the aquifer is sufficient to be protective of human health and the environment; and, to identify constituent concentrations that would trigger implementation of the Contingency Plan. This GMP provides a general discussion regarding the procedures to be used, but primarily focuses on the frequency and duration of groundwater monitoring and sampling events. Monitoring and sampling frequencies have been selected to detect triggers in a reasonable timeframe while also considering economic factors.

The analytical parameters and methods of monitoring will be consistent with the recent monitoring events, as outlined in the QAPjP and as outlined in the detailed GMP in the attached Closure Plan.

4.1.5 Residual Soil Management

Residual soil will be managed as outlined in the attached Closure Plan. Prior to initiating the first phase of capping, a topographic survey of the tank farm area will be completed to confirm our estimates that impacted soil and berm materials can be utilized as fill beneath the SWMU Cap. These materials will be placed under the capped area, below the aggregate fill. We currently anticipate that the finished elevation of the SWMU Cap will be similar to the proposed finished elevation of the HWMU Cap. The existing tanks in the tank farm will need to be temporarily moved in order to construct the cap. ANY SOILS THAT REQUIRE REMOVAL WITHIN THE AREA TO BE CAPPED WILL NOT BE PLACED OUTSIDE THE LIMIT OF THE CAP OTHER THAN IN TEMPORARY STORAGE CONTAINERS.

4.1.6 Capping

As discussed above, HCC intends to construct an engineered alternative concrete cap over the area of the Solvent Tank Farm. HCC intends to cap an additional 7,500 square foot area as identified on Figure 41.

The area identified for capping will be regraded to produce a level surface at an elevation of approximately 980.30 feet msl. A total thickness of at least 12 inches of aggregate is required under the concrete pad (cap). As an initial step to capping, the existing aggregate will be scraped from the surface and staged within the area to be capped. Once a level surface is obtained, the existing aggregate will be placed and compacted over the area to be capped. A grain size analysis of the existing material is provided for verification that the material meets the ODOT #57 classification specified. The aggregate is estimated to have a permeability of $1x10^{-2}$ cm/sec. and will be compacted using a smooth drum roller, a minimum of four passes, with each successive pass in opposing directions. The percentage of fines in the aggregate is negligible. The aggregate will provide both structural support for the concrete cap and allow for frost heave protection. The underlying soils beneath the capped area be will be compacted to a minimum of 90% of the optimum density as determined by the Standard Proctor test (ASTM Method D-698). A minimum of four test locations will be evaluated.

The concrete pad will consist of 4,000 psi reinforced concrete, 12 inches thick. THE CONCRETE WILL BE ENHANCED WITH IPANEX, A CONCRETE ADDITIVE, THAT WILL SERVE TO PRODUCE A LESS PERMEABLE, MORE DURABLE AND MORE CORROSION RESISTANT MIX. The reinforcement will comply with American Society for Testing Materials (ASTM) A615, Grade 60 minimum standards. The concrete base will be sloped to drain toward a ~~a~~ sump or series of sumps, depending on the final design of the phased cap. The pad will be constructed using continuous pours not to exceed 60 feet in wall or slab length. EXPANSION/CONTRACTION JOINTS WILL BE PLACED ON 20-FOOT CENTERS OVER THE SURFACE OF THE PAD. THE JOINTS WILL ALSO BE CARRIED UP THE SIDEWALLS OF THE CONTAINMENT AREA TO COINCIDE WITH THOSE ON THE FLOOR. THE REVISED DRAWINGS S-1 AND S-2 SHOW THE LOCATIONS OF THE EXPANSION/CONTRACTION JOINTS, DEPTH OF THESE JOINTS AS WELL AS WATER STOPS AND EXPANSION BOARD/CAP PROPOSED FOR USE IN THESE JOINTS. THIS DESIGN IS SIMILAR TO THAT PROPOSED FOR THE HWMU. All joints will have A POLYETHYLENE EXPANSION BOARD INSERTED, A SERIES OF TWO WATERSTOPS, WITH THE EXPANSION BOARD TOPPED WITH A CHEMICALLY RESISTANT CAP to provide a secondary means of containment. All sidewalls will be reinforced, integral to the pad and will be sized to satisfy all applicable regulations. The walls will be connected to the proposed HWMU Cap sidewalls using #4 dowel bars at 12 inch centers. Epoxy grout will be used to fill drill holes. Existing concrete surfaces may be roughened UTILIZING A BUSH HAMMER OR SHOT BLASTING TYPE PROCESS TO REMOVE UP TO ¼ INCH OF THE OLD SURFACE. ~~and~~ A POLYSULFIDE bonding compound (AS NOTED ON DRAWING S-2) OR BENTONITE WATERSTOP STRIP/JOINT SEALANT MAY THEN BE applied to maximize adhesion AND PROHIBIT INFILTRATION OF SURFACE WATER BETWEEN ~~of~~ the existing concrete surface to the new concrete surface. MANUFACTURER'S LITERATURE FOR SEVERAL POTENTIAL BRANDS OF CAULKING/SEALANT ARE PROVIDED IN APPENDIX G. Three specimens of the concrete will be collected during placement using ASTM Method C-31. Cylinders will be broken following a 28-day cure using ASTM Method C-39, to verify the required compressive strength is met.

Once the concrete cures, a protective coating will be applied to maximize the integrity of the concrete. ~~We currently anticipate that~~ The Railine coating (Siloxirane 2032, by Advanced Polymer Coatings) ~~will be utilized~~ WAS APPLIED OVER THE CURRENT HAZARDOUS WASTE TANK FARM CONCRETE as this material was approved by OEPA for application ~~over the current hazardous waste tank farm concrete~~. THE RAILINE COATING SILOXIRANE 2032 IS NO LONGER MANUFACTURED AND HAS BEEN REPLACED BY A CHEMLINE PRODUCT. THIS NEW PRODUCT (CHEMLINE 784/32) IS FAR SUPERIOR TO THE OLD, IN THAT IT IS MUCH STRONGER AND PROVIDES SUPERIOR CHEMICAL RESISTANCE TO THAT OF THE SILOXIRANE 2032 PRODUCT. However, an equivalent coating could be utilized depending on manufacturer availability when all cap phases are constructed. The coating will provide chemical resistance to and corrosion resistance as well as added durability for the surfaces. ~~See Appendix F for manufacturer's literature on the Railine coating.~~

THE NEW PRODUCT HAS A VERY DENSE STRUCTURAL CONFIGURATION OF 28 FUNCTIONAL GROUPS PER MOLECULE, WHICH RESULTS IN A STRUCTURE WHEN

POLYMERIZED OF 784 CROSS-LINKS. THE SILOXIRANE 2032 HAD 25 CROSS-LINKS. HUKILL WILL INSTALL A PRIMER (CHEMPRIME 403) FOLLOWED BY A DOUBLE APPLICATION OF 784/32 TO RESULT IN A TOTAL COATING AS CURED THICKNESS OF APPROXIMATELY 20 MILS. THE PRIMER WILL SEAL THE CONCRETE SURFACE AND ACTUALLY STRENGTHEN THE CONCRETE. MANUFACTURER'S LITERATURE FOR THESE PRODUCTS IS PROVIDED IN APPENDIX F OF THIS REVISED CLOSURE PLAN. ADVANCED POLYMER COATINGS, THE MANUFACTURER OF CHEMLINE 784/32 WILL PROVIDE A 5-YEAR GUARANTEE ON THE COATING PROVIDED ONE OF THEIR CERTIFIED INSTALLERS APPLIES THE COATING.

In addition to the fact that concrete has a permeability on the order of $1X10^{-9}$ cm/sec. with the incorporation of the IPANEX admixture as noted in the reference materials included in Appendix G, the ~~Railine~~ CHEMLINE coating proposed will further ensure an impermeable surface. The sloped surface of the proposed concrete pad will also reduce the contact time of any liquids within the tank farm.

Once each phase of the concrete cap is constructed and allowed to cure, HCC will install storage tanks as appropriate for business requirements. The pad/cap will be constructed to meet structural requirements in consideration of the largest anticipated tanks.

The pad/cap will be constructed consistent with Drawings S-1, S-2 and S-3 provided in Appendix E. The detailed design calculations for the SWMU Cap will be provided in a Design Report that will be submitted to the OEPA for approval as each phase of capping is planned. THESE CALCULATIONS WILL BE SIMILAR TO THOSE PROVIDED FOR THE FORMER HAZARDOUS WASTE TANK FARM, AS INCLUDED IN APPENDIX H OF THE REVISED CLOSURE PLAN DATED MAY 2000, REVISED APRIL 2001.

4.1.7 Surface Water Management

Approximately 2-5 feet of gravel fill material is located beneath the solvent tank farm. The gravel fill is underlain by a ten foot thick layer of native clay soil. This material will continue to serve as a low permeability barrier layer beneath the cap. This barrier layer was tested on April 11, 2000, using shelby tubes to obtain two undisturbed soil samples. The permeability was measured using ASTM Standard D-5084 (ASTM D-5084) Standard Test Method for Permeability of Cohesive Soils (Flexible Wall Permeameter). The average permeability of the undisturbed samples was 8.4 $x10^{-8}$ cm/sec. as documented in the laboratory analysis reports provided in Appendix I.

HCC presently maintains a water collection system for surface water in the form of a sub-surface drainage system (perched water) that is contained in the fill that lies above the clay in and around the tank farm. The collection system proposed as part of the HWMU cap MAY ~~will~~ be expanded BY ADDING A SECOND DRAINAGE SYSTEM, PARALLEL TO THAT FOR THE HWMU, TO THE WEST OF THE SWMU CAP, or may be ~~unnecessary,~~ ABANDONED VIA CAPPING OR PUGGLING, given that the entire impacted area will eventually be capped, and because the natural attenuation remedy will address any impacts from percolating perched water. HUKILL HAS DESIGNED THE PROPOSED DRAINAGE SYSTEM FOR THE HWMU SO THAT IT WILL NOT INTERFERE WITH THE

CONSTRUCTION OF AN ADJACENT PAD. THE DRAINAGE SYSTEM PROPOSED WILL BE INSTALLED 1 FOOT BELOW EXISTING GRADE. THE NEW PAD WOULD BE CONSTRUCTED ABOVE THIS DRAIN AND NOT INTERFERE WITH THE CONSTRUCTION OF THE PAD OR RESULT IN THE DESTRUCTION OF THE DRAINAGE SYSTEM.

HUKILL ENVISIONS THIS DRAINAGE SYSTEM WOULD REMAIN IN PLACE AND A SECOND DRAINAGE SYSTEM SIMILAR TO THAT PROPOSED WOULD BE INSTALLED UPGRADIENT OF THE NEW CONTAINMENT AREA PAD. THE NEW DRAINAGE SYSTEM WOULD TIE INTO THE SAME CONCRETE VAULT AS THAT PROPOSED IN THIS CLOSURE PLAN.

The SWMU cap ITSELF will contain sumps similar to the sump proposed for the HWMU cap. Surface water WITHIN THE CAPPED AREA (CONTAINMENT AREA) will be managed as proposed for the HWMU cap. The retention basin system will continue to be utilized to retain collected drainage water.

5.0 CORRECTIVE ACTION CONTINGENCY PLAN

The method of closure specified in this CMI Plan allows contaminated soils to remain in place and, as a result, necessitates the use of Deed Restrictions for portions of the HCC property. Given that soil will remain in place and that post-closure monitoring is required for the HWMU closure, post-closure monitoring will be conducted. The post-closure monitoring will also serve to document ongoing natural attenuation processes. The use of a tank farm as a cap and the associated maintenance of the tank farm is expected to preclude the need for a Contingency Plan associated with impacted soil. Therefore, this Contingency Plan focuses entirely on a remedy that would be implemented in stages in the event that natural attenuation was not adequately addressing the groundwater impacts.

The detailed Contingency Plan is presented in Section 5.0 of the Closure Plan. HCC has developed a series of triggers that will be utilized to establish criteria for additional remedial actions should the monitored natural attenuation process deviate from its present level of biological activity.

Should these trigger levels be reached and confirm deteriorating conditions for natural attenuation, HCC will institute a more rigorous groundwater monitoring program, by increasing the monitoring frequency to quarterly if, at the time the frequency is less. Increased monitoring will occur for a one-year period, at which time a report will be prepared to specify corrective actions and remedial measures to be implemented. Should it be deemed necessary to implement corrective actions, HCC will implement one of the proposed contingent technologies within 60 days of approval from the OEPA. In addition, to initially increasing the monitoring frequency, one of the following contingent technologies will be implemented depending on the specific constituent and concentration that activates the "trigger": Oxygen Release Compound (ORC®) to stimulate the aerobic degradation of metabolites; Hydrogen Release Compound (HRC®) to stimulate the anaerobic degradation of source COCs or recalcitrant metabolites; and/or, groundwater extraction and treatment.

The monitoring frequency and "triggers" are discussed in more detail in Section 5.0 of the attached Closure Plan.

6.0 CORRECTIVE ACTION SCHEDULE

The schedule presented below has been developed to complete the corrective action activities as proposed in this report. Estimated completion dates are based upon receipt of approval of the CMI Plan from the OEPA.

Corrective Action Implementation Schedule

Activity	Estimated Completion Date
OEPA Approval of CMI Plan	Not Applicable
Natural Attenuation Groundwater Remedy	Ongoing
Groundwater Monitoring	Ongoing/Immediately
Submittal of proposed Design of each Cap phase	60 days prior to construction
Completion of entire SWMU Cap	5 years after OEPA Approval

7.0 REFERENCES

Eder, 1987. *Site Investigation Report*. Hukill Chemical Corporation – Bedford, Ohio.

Eder, 1988. *Site Investigation Report, Revision 1*. Hukill Chemical Corporation – Bedford, Ohio.

ASTM (The American Society for Testing and Materials) Standard Procter Test. ASTM Method D-698.

ASTM. ASTM Method A-615.

ASTM. ASTM Method C-31.

ASTM. ASTM Method C-39.

TABLE 6
FIELD QUALITY CONTROL SAMPLES
Hukill Chemical Corporation
Bedford, Cuyahoga County, Ohio

Parameter	*Trip Blanks*	*MS/MSD (1)*	*EQUIPMENT BLANKS*	*Duplicate Samples*
VOCs	1 per cooler containing samples for VOC analyses	1 set per 20 samples	1 PER 20 SAMPLES	1 per ~~20~~ 10 samples
Total Organic Carbon	NA	NA	1 PER 20 SAMPLES	1 per ~~20~~ 10 samples
Nitrate Nitrogen	NA	NA	1 PER 20 SAMPLES	1 per ~~20~~ 10 samples
Alkalinity	NA	NA	1 PER 20 SAMPLES	1 per ~~20~~ 10 samples
Chloride, Sulfate	NA	NA	1 PER 20 SAMPLES	1 per ~~20~~ 10 samples
Dissolved Manganese	NA	1 set per 20 samples	1 PER 20 SAMPLES	1 per ~~20~~ 10 samples
Total Phosphorus	NA	NA	1 PER 20 SAMPLES	1 per ~~20~~ 10 samples

(1) Although the MS/MSD is actually considered a laboratory QC sample, it is listed here to remind sample personnel to collect triple volume to account for the original (unspiked) sample, and MS and the MSD samples.

Section J
Federal Laws

PART B

SECTION J

PART B

SECTION J

OTHER LAWS

Information will be provided in accordance with the requirement of OAC 3745-50-44 (A)(20) (40 CFR 270.14(b)(20) at the request of the Ohio EPA. At this time, however, we believe this facility is in compliance with the following Federal Laws; Wild and Scenic Rivers Act, National Historic Preservation Act of 1966, Endangered Species Act, Coastal Zone Management Act, and the Fish and Wildlife Coordination Act.

CERTIFICATION

I certified under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. OAC 3745-50-42 (D)

DATE: 4/12/06

Signature by: Robert Hukill

Robert L. Hukill, President
For Hukill Chemical Corporation